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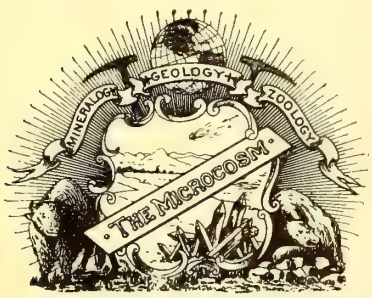

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During 1895 we shall use this space in calling attention to our high-class stock of Bird and Mammal Skins; Reptiles and Batrachians, either alive or in alcohol; Mounted Specimens; Skulls; Histological Material, etc.

We wish all interested parties to watch this space closely, as we shall frequently change the form of this advertisement and special offers will be made here, as our stock warrants it.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....	5:55		8:00	10:30	2:20	5:35	10:00
Albion.....	6:50	7 00	9:00	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:50
Niagara Falls.		6 35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25		6:35
Albion.....	7:05	8:20		1:00	3:25	6:45	7:55
Rochester.....	8:05	9:30		2:05	4:40		9:00

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THE OOLOGIST

for 1895 will be amply illustrated, and

$300 Worth of Prizes

will be presented to its Readers and Contributors.

The OOLOGIST is without question the most popular and instructive magazine, devoted to Birds, their Nests and Eggs, ever published, and while of special value to the Oologist and Ornithologist, its publisher is not alone in his belief that all Teachers, Scientists, Naturalists, Sportsmen and Curiosity collectors will find the OOLOGIST not only worthy of their attention, but of their *Subscriptions*. With 1895, the OOLOGIST entered its twelfth volume, and it will be the aim of its Publisher with the aid of its subscribers, to make it of greater value than any preceeding one. Each number for '95 will contain thirty-two pages and will be promptly and regularly issued the first week of each month and sent pre-paid to any part of the World at only 75 cts. a year.

AS AN ADVERTISING MEDIUM.

During '94 it attained an average monthly circulation of 4,167 copies It is recognized everywhere as the leading medium through which to reach the class for whom it is published. Over 50 *new* ads. appear in each issue, and its patrons, with rarely an exception, say "*it pays.*" Rates are exactly double those of the NATURAL SCIENCE NEWS. Subscriptions and renewals will be taken at the old rate—50 cents per year until February 15.

If you are not already a paid subscriber to the OOLOGIST send in your subscription or renewal by Return Mail.

Address FRANK H. LATTIN, Pub.,
Albion, N. Y.

Natural Science News.

VOL. I ALBION, N. Y., FEB. 2, 1895. No. 1

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

NATURAL SCIENCE NEWS is published for the benefit of students of Natural History in *all* departments—if the branch in which you are most interested is not represented it will be your own fault. Send in your notes and gleanings or at least write along what line you desire information.

On Jan. 11th we addressed the subscribers of the OOLOGIST and other known *live* naturalists in relation to the publishing of the NATURAL SCIENCE NEWS. In this announcement we stated that "our stakes were set for 500 advance subscribers." On Feb. 1st we find by actual count that we have received 543 of these advance subscriptions with more coming at a rate of about thirty per day. In this same announcement we stated that subscriptions mailed us on or before Feb. 15th would be ranked as "pioneers." At the rate they are now coming we can safely predict *over* 800. Our 543 advance subscribers are distributed throughout the United States and Canada. Ontario, Quebec, Manitoba and all but six of the states and territories are represented. New York leads with 90, followed by Illinois with 54; Pennsylvania, 43; Michigan and Ohio, 35 each. The distribution of our "pioneer" subscribers will be given in detail in an early March issue.

Mexican Jumping Beans.

The familiar jumping or dancing beans, which have been displayed of late in the shop windows, and extensively advertised by curio dealers throughout the country, have become a very popular novelty, and great quantities of them have been sold.

The bean is the seed of the *Sebastiana palmeri*, an Euphorbiaceus plant, related to the castor oil plant (*Rincinus*), which grows abundantly in various parts of Mexico. The curious movement is caused by the antics of a larva, the *Carpocapsa salitans*, which is imprisoned in the hollow shell of the bean.

The larva resembles closely the common apple worm of our orchards. The bean has no particular intrinsic value. *Meehan's Monthly* suggests that it is quite probable that in a round pea, motion might be observed if closely watched before the "worm" crawled out of it.

Nature As I See It.

BY MORRIS RICE.

For several years I have been studying a book—a volume, made up of poetry and prose.

The poetry is pure, tender, and sweet.

The prose, eloquent, earnest, and noble.

The title of this wonderful book is Nature.

It is a living book, the very words breath, and each and every page tells a story in a language of its own.

We find the poetry in the birds, in the beautiful flowers, the majestic mountains, the warm sun-shine, and sometimes in the drifting clouds: they are all beautiful living poems.

The prose we see in the tall naked trees, in the great rivers, in the broad plains, and in the barren scene of a winter land-scape; they are paragraphs of living prose.

Where can you find a sweeter verse than in a bunch of beautiful flowers, even their breath is poetry, divine poetry.

Did you ever look across one of those broad western prairies with the gigantic mountains in the background, does it not present a grand piece of prose?

What speaks more eloquently than a strip of woods in winter when the trees and shrubbery are covered with snow?

Have you ever thoughtfully studied bird-life, have you ever thought what delicate creatures some of them are?

How very beautiful and interesting they are—bits of verse swimming through the air, or as that noble writer, John Ruskin, has said—

"It is little more than a drift of air brought into form by plumes."

They are feathered verses from the Divine Hand.

"Sweet the song of the birds at dawning,
When the grass is wet with spangled dew."

Can you show me a more beautiful picture than an April sun rise, or anything more magnificent than an Autumn sun set?

This great book of Nature is replete with puzzles and secrets, which requires persistent, and loving study to unravel,—each year, each season will reveal something new.

The system of Nature is wonderful, poetic and sublime.

Her laws are mysterious and profound.

Through the mighty lion and sky soaring bird down to the ugliest grub beneath the dead leaves, God speaks to us—to you!

The heart of man skims the surface of Nature but the spirit seeks the inner passages.

Remember God has created nothing unworthy of observation and study.

The study of nature promotes health, a kind disposition and noble thoughts.

Oliver Wendell Holmes has said: "I have written many verses but the best poems that I have produced, are the trees that I have planted on the hill-side."

Nature is too varied to be uninteresting, to deep to produce narrowmindedness, and too grand to be easily forgotten.

Follow that excellent motto, "Keep your eyes open," and get a better understanding of Nature.

"Find tongues in trees, books in the running brooks, sermons in stones and good in everything."

For thousands of years we have searched and studied, and yet not half do we understand the most common things that surround us.

The wonders and beauties of creation are manifold, and knowledge has no limit.

The "Glass or Joint Snake."

Ophisaurus ventralis.

Stories concerning the "glass snake" are so numerous and so marvelous that one might feel justified in doubting the reptiles existence and classing it with the chimaeras, dragons and griffins of mythology. There is, however, a real living and breathing animal which forms a basis for these stories, and the properties of this animal are so wonderful that they explain the origin of the stories, although they do not excuse the exaggeration.

Casting aside the thick veils of fable and fictitious names, and viewing the animal by the light of science we discover that although long, slender, snake-like and destitute of limbs it is not a snake at all, but a lizard.

It is not the presence of limbs which distinguishes the order of *Lacertilia* from that of *Ophidia*, for, contrary to the generally accepted opinion, there are snakes with legs, rudimentary ones at least, and lizards without even the rudiments of them.

Though destitute of limbs the *Ophisaurus* would never be mistaken for a snake by any careful observer. The bones of a snake's brain case are firmly ankylosed together, those of the lizard are less firmly united. The snake's upper and lower jaws are so loosely jointed together that it can swallow objects with a diameter greater than its own, while the jaws of the lizard are so firmly connected that the mouth is not distensible. The sides of the lower jaw of a snake are joined together by a flexible cartilage, so that each side may be advanced or withdrawn independent of the other, while the rami of a lizard's jaw are firmly united at their symphysis so that the sides must move together. The eyes of snakes have no movable lids so that it seems always looking about with a fixed, stony stare, while the eyes of the lizard have movable lids, and its frequent, rapid winking gives it a brisk and cunning look. Snakes have no apparent ears, while the ear openings of the *Ophisaurus* are plainly visible, being on a line with the mouth, and somewhat larger than the nostril.

The *Ophisauri* have from fourteen to sixteen longitudinal rows of scales, very much like those of snakes, but instead of the broad plates which cover the ventral surfaces of *Ophidians* they have the under parts of their bodies sheathed, like their backs, in small scales arranged in about 120 transverse rows from the head to the vent,

The head of the *Ophisaurus* is small and narrow, tapering to a long, round tipped snout which may be of service in burrowing. The head is attached directly to the body without any distinct neck.

Of two specimens kept by me one was marked on the upper surface by narrow lines of dark brown on a ground of greenish olive which shaded into a polished slate color on the ventral surface. The other was almost black on its dorsal surface and was destitute of spots, their place being taken by longitudinal rows of whitish occellated spots. The lower jaws of both specimens were sulphur yellow, shading into a darker hue, approaching orange. Their heads were very dark olive, with mottlings of sooty black.

Near the center of the dark interparietal plate of each was a minute white spot, the so called pineal eye, supposed to be the abortive relic of the third eye which some remote ancestor carried in the top of his head. It has been suggested that this pineal eye may still be sensitive to light, though such is probably not the case.

Like most lizards my "glass snakes" were shy and timid and did not take kindly to petting at first. Still they made no demonstration of hostility, except when first captured and then their efforts to bite were very feeble. Needless to say their bites can do no damage, for the gape of their jaws is small and their teeth are very small and weak. One of them was fifteen and the other twenty inches in length, though they are said to attain a length of three feet.

The tail of the *Ophisaurus* is extremely long, being about twice the length of the head and body, and, like other lizards it is liable to lose its tail. A very slight blow will suffice to break off the tail of almost any lizard, and the detached tail will writhe and flap about in the throes of death, often springing several inches from the ground, while the owner darts away to some place of concealment, where it rapidly recovers and soon grows another tail. The student and collector soon learns the fruitlessness of catching such animals by their tails.

The great length of the tail of *Ophisaurus* makes the facility with which the creature parts with it seem remarkable, for it is really startling to see an animal lose two thirds of its length and still wriggle off undismayed. It is said that the tail when broken from the body will itself divide up into several squirming pieces, though I have never witnessed this myself.

Among people not accustomed to make nice distinctions among reptiles the *Ophisaurus* is invariably regarded as a snake, and the sight of a "snake" breaking into two or more pieces on receiving a slight blow, and the shortest of these fragments escaping is a phenomenon demanding explanation. It is always easier to "jump at conclusions" and to take things for granted than to reason and investigate, so it is assumed that this "snake" having the power of apparently voluntarily dividing itself up must necessarily be able to reunite its fragments with equal facility.

In spite of its utter absurdity this view is generally accepted, and whenever the partial destruction of an *Ophisaurus* is witnessed the imagination is called upon to account for the phenomenon, as the facts are embellished and explained until the poor little lizard seems entitled to rank with the Phœnix.

Although so many people believe that the "joint snake" or "glass snake" reunites its shattered fragments there are but few who have the patience to wait and see this done, or the hardihood to say they have seen it. Those who tell these stories, often in good faith, usually add that they gained their information at second hand, but there was one contributor to the *Scientific American* who claimed that he had witnessed the feat himself. The difficulties in the way of fitting together shatterd nerves, blood vessels, and bundles of muscular fibers so that the restored animal will be ready for business on short notice are so great that it is difficult to suspend judgement while waiting for the story to be corroborated.

The *Ophisaurus* is occasionally, though rarely, found near Vincennes, and is thought to be sparsely distributed throughout Indiana, though its ordinary habitat is farther south. It is to the southern states, then, that we must look for information regarding its breeding habits and general life history, subjects concerning which we are entirely ignorant.

We know just enough about it to feel sure that it is a perfectly harmless and useful little animal whose mission in life is the destruction of insects and worms, for which it deserves protection.

Anyone in possession of any farther facts about it should make them known.

ANGUS GAINES,
Vincennes, Indiana.

What is the Best Method of Wrapping Fresh Bird Skins?

After using several methods of wrapping up fresh bird skins—to say nothing of the old ways of using paper cylinders and corrugated drying boards—I believe the following to be the best.

Probably the best way to illustrate will be to use a dried skin of the Tree Sparrow or a bird of similar size.

Take a piece of split sheet cotton 4x6 inches in size and in the middle line 2 inches from the left hand end break a small hole sufficient to enter the bird's bill.

The sheet cotton now lies flat upon the table before you

Take the bird between the thumb and and first two fingers of the right hand, bill pointing to your left, breast upward, lay it upon the cotton at the same time passing the bill through the hole; the left hand aiding the process.

The two inch flap is now brought up over the breast and fitted smootly on sides of neck and over the bend of the wings where it is held in place by the right hand.

Next, lap the left hand corners over once so that the edges lie close to the sides of neck and parallel to it.

The side flaps are now brought up smoothly, passing a little beyond the medium line of the breast and abdomen—thus lapping each other.

The cotton is then fitted over the abdomen, the lapping of the raw edges being sufficient to keep it in place without further fastening—though as a matter of fact one naturally lays the results of a days collecting side by side as an additional precaution.

Care should be taken not to wrap the bird so tightly as to destroy the delicate contour lines though should this occur, a gentle picking with the thumb and finger at the point of contact is usually sufficient to relieve the pressure.

See that the points of the wings are in proper position and that the secondaries are not bunched, but override each other naturally.

Care should be taken not to bend the head too far backward—the bill should point upward and forward at nearly an an angle of 45 degrees.

The method may be varied with good success in such birds as Woodpeckers and Snipe where the head is laid with the bill pointing to the right or left.

So far as I know the above method was first used by Mr. A. W. Anthony now of San Diego, Cala., who kindly explained it to me, (as also the suggestion for the use of wooden tooth-picks in the necks of birds' skins) and it is generally adopted by those who have the good fortune to know it.

HORACE G. SMITH,
Denver, Col.

Buying a Microscope.

The expense of ignorance is ever apparent to the observing person. In fact, every one realizes the cost of the bitter lesson taught by experience. We were made to realize this recently when called to examine a microscope which a druggist had purchased at an expense of forty-five dollars. The owner of the instrument was obliged to depend on the judgment and integrity of the firm from which he ordered it, as his knowledge of the instrument was limited to its name. As a result the druggist exchanged forty-five dollars dollars for a microscope that we would not pay ten for, unless it was to have a cabinet specimen of different styles of manufacture.

It is just as true as it is unfortunate that the market is flooded with poor microscopes which are being sold at extravagant prices. It affords us pleasure to say that they are not the product of American industry, but are brought to this country to satisfy that morbid idea that so many have which leads them to believe in the superiority of anything that is "foreign," and to rave over an article from Paris. It is not our intention to convey the idea that all foreign microscopes are of an inferior quality, for this is far from the truth. However, it is noteworthy that the United States manufactures fewer poor instruments than are imported for sale here. In fact, there is no necessity or even a good valid excuse for a pharmacist purchasing anything but an American microscope.

A word of advice anent the subject of selecting a microscope for pharmaceutical work may not be amiss at this time. Students at colleges of pharmacy, and those druggists who live in cities where such institutions exist, should embrace every opportunity for acquiring knowledge of the microscope as an optical instrument. This will enable them to select the microscope most suitable for the work and within the range of their means. Do not invest less than twenty-five dollars, and if possible expend fifty or seventy-five dollars for an outfit.

Those who are so situated that they cannot become familiar with the microscope and be their own judge must depend on others for a selection. Their opticians, as a rule, are not microscopists, much less pharmacists, and their judgement is often materially strabismic from the effects of the profit influence. To them the best microscope is the one that costs them the least and sells for the highest price. It is far better for a druggist to consult some competent microscopist and place his order accordingly.—H. M. Whelpley in *Meyer Brother's Druggist.*

To Much for Reynard.

One night in January a fox entered the hen house of a man at Pleasant Point, Maine and carried off a fat rooster.

The bird was found roosting on a stump the next day alive and apparently none the worse for wear, while the body of the fox was found about a mile away, dead—Next!

How to Obtain Foraminifera from Chalk.

The following is probably an improvement on the methods usually given in books. The chalk to be used must be native chalk, the sticks of chalk used in schools is ground and prepared and will not answer the purpose. Carpenters chalk is native unprepared chalk.

Boil some fragments of chalk in a strong solution of Glaubers Salts (Soda Sulphate) set aside to cool and crystallize. This separates the chalk into a powder, then by repeated washings and settlings the salts and the light fluffy debris are washed away and perfect shells obtained in the sediment.—*The Microscope.*

Oological Peculiarities.

With the the exception of occasionally finding albinos there is very little written in regard to oological peculiarities, such as natural formations of objects on the shells of eggs of the different species of birds. We have been very successful in securing some exceedingly rare curiosities in the line of natural objects on the ground color of eggs, which may prove interesting to oologists. The markings are distinct and of a dark shade of color and the objects are very plainly recognized by anyone at glance. It is extremely marvelous how the figures are formed on the shells of eggs as to represent birds, etc., but, however considering the numerous blotches and various crosslines on one egg of certain species, the formation of some object would, rarely, naturally be the result. It is the common Red-and-Buff-Shouldered Blackbird that unintentionally possesses the most artistic skill, and she is an artist of considerable notoriety and ability.

The engravings, which are exact reproductions, will enable the reader to get an idea as to how they are, although to personally examine the eggs would prove more interesting.

The above cut is an oddly shaped egg of the above mentioned Blackbird with the figure of a gull on the side.

No. 1 is an egg of the same species and represents a hound. The objects on eggs No. 1, 2 and 3 are all on the larger end.

No. 2 is the exact profile of a duck and is decidedly the finest and truest represented of the four of the objects illustrated. It is also an egg of the same species.

No. 3 is an egg of the Baltimore Oriole and the object being so small the engraving does not justly give it due credit, for a personal examination reveals a quail on nest with straws distinctly visible.

This may, perhaps, not hardly seem comprehensive to some readers; the markings on eggs being inclined to represent objects (especially birds,) but, however, it is decidely true. These odd oological specimens, should, of course, be seen to be appreciated.

1 2 3

Other peculiarities in the collection is a set of 13 eggs of the American Coot which contains a runt egg that measures 1.45x1.02; an odd-shaped egg of the Black-throated Bunting which measures 1.10 in length; two albinos of the Kingbird, and a set of the Western Meadow Lark which contained 5 and 7 of the Cowbird. Twelve eggs for a Meadow Lark to incubate is quite a nest full.—*The Naturalist.*

[From extended observation, made during the past fifteen years, the editor of NATURAL SCIENCE NEWS has found that albino and abnormally marked and colored eggs are not of unusual occurence while runt and double-yolked specimens are nearly if not quite as frequently found among birds as among our domestic fowls, in fact he believes that from a series of 1000 specimens collected at random from birds when compared with the same number taken from a poultry yard, when its occupants have proper food and range, that the greater per cent of "peculiar" eggs will be found in the bird series.

The above article calls to mind, an egg in a set of Baltimore Oriole's which the writer collected in the season of '81 upon the larger end of which was plainly scrolled in extraordinarily well formed characters the very appropriate word "sin". Conscience smitten, he has not had the hardihood to disturb a nest of this most beautiful and interesting of our northern birds since. A friend had an egg of this same species upon which was very perfectly delineated a web with occupant of the Spider.—ED.]

Columbian Museum Burgularized.

On Saturday afternoon, Jan. 26th, a case full of jewels and rare coins were stolen from the Field Columbian Museum.

Director F. J. V. Skiff of the museum states that the intrinsic value of the property stolen would not exceed $500, "There were," says Mr. Skiff, "forty-one pieces of oddly designed hammered gold ornaments, consisting of ear-rings, bracelets and finger-rings, that were valuable to the museum only. We might duplicate them, but it would take considerable time and expense to do so. They were presented to us by W. Vernon Booth, and we are of course sorry to think that we have been so unfortunate as to lose them."

The case from which the jewelry was taken was shown by Mr. Skiff to a reporter of the *Chicago Record*, and on it the marks made by a burglar's "jimmy" were plainly discernable. There was but one guard in the eastern section of the Museum at the time the robbery occurred, and the Egyptian room was unusually dark, owing to the skylight in the roof being covered with a heavy sheet of snow.

An Insect Sale.

A curious auction sale was held in December in New York—that of 2,000 insect specimens owned by the New York Entomological Society, for the benefit of their printing fund. The prices obtained ranged from 10 cents for large-sized brown moths, *Telea polyphemus*, to $2.50 for brilliant western moths—*Kodiosoma tricolor*. Another western moth, *Æmilia roseata*, brought $2.

Some beautiful specimens of *Papilio sarpeton*, or tailed African butterfly, of rich metallic color, brought $1.50 each. Gorgeous-winged Arizona butterflies and brown Florida bettles brought five cents each.

The prices realized were much lower than at a former sale.—*Country Gentleman.*

From a Tree to a Newspaper.

A Cincinnati man describes for a reporter of the *Inquirer* of that city, a novel sight he saw recently at a mill devoted to making paper of pine tree pulp. "I was invited to select a tree, which I did and it was cut down for me in the morning. I watched it during the day undergoing the various processes of paper making. At six o'clock that evening the tree was paper. At midnight a portion of it was sufficiently dry to be taken to a printing office, and a few of the next morning's papers were printed on this product. From a tree to a printed newspaper in twenty-four hours is probably the best time on record."

A FEW, FROM HUNDREDS:—It appears that the NATURAL SCIENCE NEWS is not only expected, but destined, to fill the regulation "long-felt want."

I herewith enclose $1 for advance subscription to the NATURAL SCIENCE NEWS. I trust your venture shall meet the hearty approval of collectors *en masse*, as such a publication will be of immense value to one and all.—Carrington C. Bacon, Imboden, Ark.

I feel that the NATURAL SCIENCE NEWS would be a good investment, and if it is managed in the same way that the OOLOGIST is, it will meet with success.—Horace A. Gaylord, Pasadena, California.

I send you herewith my subscription to your proposed new weekly, because I think there is room for such a publication as you outline, and because I judge you are able to "fill the bill."—W. G. Wright, San Bernardino, Cal.

I wish you every success in the future, as it has been in the past.—Chas. D. Benjamin, Colorado Springs, Colo.

I herewith send my subscription to the NATURAL SCIENCE NEWS, and may your enterprise prove a big success. —T. E. Slevin, San Francisco, Cal.

Am glad to have the chance of subscribing for the NATURAL SCIENCE NEWS—have been wanting something of that kind for sometime—hope you will have great success.—N. W. Fain, Asheville, N. C.

I already take four papers but trust that your weekly will be ahead of them all, so book me as a charter subscriber. Wishing you the best of success, I am Ologically yours.—Frederick Hill, Lyme, Conn.

You may put me down as a subscriber to the NATURAL SCIENCE NEWS, and I enclose $1 for the same. My wish is, that your new paper may be a greater success than you anticipate. —R. W. Ford, Bristol, Conn.

I wish you every success with the NATURAL SCIENCE NEWS.—W. C. Scott, Port Hope, Ont., Canada.

I hope your paper will bring you a lot of subscribers, as all who are interested in Natural History will need to take it.—Wm. J. Wintemberg, Washington, Ont., Can.

The NATURAL SCIENCE NEWS, coming weekly as it does, will, I feel certain, be a welcome visitor to the homes of hundreds of Naturalists, and under the same management, will be up to the same high standard which the OOLOGIST has attained.—L. B. Gilmore, Blooming Valley, Pa.

I take pleasure in sending my subscription for the NATURAL SCIENCE NEWS for a year, and wish you every success in your undertaking. Good luck to the new scientific weekly, and I shall look for the first issue of the NATURAL SCIENCE NEWS, and hope to increase the interest the more I read it.—M. T. Cleckely, Philadelphia, Pa.

I have been on the lookout for such a paper.—Frank Lucock, Pittsburgh, Pa.

For a long time I have been wanting to take a paper on Natural Science. I give you my best wishes for the welfare of the NATURAL SCIENCE NEWS. —H. B. North, Janesville, Wis.

I think that the NATURAL SCIENCE NEWS will fill a long felt want and I am glad that I am a "pioneer" subscriber —A. D. Grutzmacher, Mukwonago, Wis.

I hope your venture will prove (as I have no doubt it will) a success.—J. A. Dakin, Syracuse, N. Y

I await with intense interest the appearance of your NATURAL SCIENCE NEWS, which I know will be all that you claim. The fact that it comes every week is gratifying; a month for a Natural History Magazine is too long to wait. It shall have my earnest support.—D. Franklin Weeks, Portland, Oregon.

I wish the NATURAL SCIENCE NEWS a glorious success. —Ellis F. Hadley, Dayton, Ore.

May the NATURAL SCIENCE NEWS ever prosper, and enlighten the students of Natural Science.—Charles Barber, Hall's Peak, New Mexico.

I will try and get you as many subscribers for your paper as I can. It is just the thing I have been looking for. Wm. Hancock, Alton, Ill.

Accept my hearty congratulations and hopes for the success of the "NATURAL SCIENCE NEWS. It is the very thing I have been wishing for.—C. L. Furry, Alden, Ia.

I hope you will meet with the best of success.—Almon E. Kibbe, Mayville, N. Y.

I was pleased to hear that you intended publishing a scientific weekly, and think it will meet with great success.—Eugene A. Weeks, Newport, N. Y.

NATURAL SCIENCE NEWS coming once a week will fill up a large gap and I predict a large circulation. "Git thar Lattin."—C. F. Stone, Branchport, N. Y.

I congratulate you on the good literature you aim for your publications.—W. C. Mills, Chicago, Ohio.

You may count me as one of the advance subscribers to the NATURAL SCIENCE NEWS. Hoping you will meet with success in your new venture.—M. L. Chaney, Sardinia, Ohio.

I hope the NATURAL SCIENCE NEWS will prosper as its contemporary the OÖLOGIST has.—Morris R. Ebersole, Cincinnati, Ohio.

I confess the idea of a weekly paper devoted entirely to natural science was rather startling at first, but I trust it will be a success from all standpoints. You deserve the hearty cooperation of all interested parties, and if I can be of any service to you, I trust you will feel at liberty to call on me at any time.—Fred H. Stoneburn, Harrisburg, Pa.

I wish you success in all your undertakings, and especialy in your OÖLOGIST and NATURAL SCIENCE NEWS. The latter being a weekly paper, will surely give it a wide circulation, and must consequently be a good advertising medium.—Charles Meyer, Elmore, Ohio.

You will find enclosed $1.00 for which send me the NATURAL SCIENCE NRWS one year beginning with the first number. Wishing success to your paper, I am yours, Tho's M. Davis, Smithland, Ky.

Wishing you success in your venture, I am, respectfully, R. A. Browne, Mt. Carmel, Ky.

I wish you the best of luck with the new paper.—Fred E. Pomeroy, Lewiston, Me.

Wishing you all possible success in your new enterprise, I remain yours truly.—F. E. Dobson, South Natick, Mass.

You have my heartiest wishes for the success of your new paper. Sincerely.—C. A. Proctor, Worcester, Mass.

Of course you can book me as a "sub" on your new paper.—Ed Van Winkle, Van's Harbor, Mich.

Wishing you success in your venture, I am as ever, yours.—F. M. Falconer, Hillsdale, Mich.

Wishing you and the new journal the success it is sure to merit, I am yours.—C. H. Dickinson, Grand Rapids, Minn.

It gives me great pleasure to be enrolled as a pioneer subscriber to the NEWS, from which I hope to derive valuable information and pleasureable reading. I wish you every success in its publication, and shall eagerly look for the first number, and if I can get other subscribers will do so.—Joseph Fairhall, Grape Creek, Ills.

Wishing you all success, we remain.—Baker & Hanson, Myers, Fla.

Enlist my name as a subscriber to the NEWS, and do not fail to send me every number. May God assist you to make it a success; I will certainly do my share to keep it up. Hoping you success, I remain, Yours.—R. N. Williams, Tallahassee, Fla.

Hoping you will meet with success with NATURAL SCIENCE NEWS, as you should, I am, Yours truly.—John E. Harris, Editor *Florida Facts*, St. Francis, Fla.

I think that any one that is interested in Natural Science could not afford to be without it.—Fred W. Johnson, North Evanston, Ill.

About ten minutes ago, I received your letter, and here is the dollar and I didn't kiss it good bye either, for I know from past experience that money sent to "Lattin" is well invested. Make my subscription for two years. Wishing you and the NATURAL SCIENCE NEWS success, I am, Very truly yours.—Virginus H. Chase, Wady Petra, Ills.

I received your letter today, and am glad to send my name as a subscriber fo NATURAL SCIENCE NEWS.—Melvin Somes, Fort Dodge, Ia.

Natural Science News.

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Nothing inserted for less than 25 cents

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12 plain perfect Flint Arrow Heads,					$ .50
12 nice	"	"	"	"	1.00
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Look at these prices and then compare them with those of other dealers. Having recently purchased a large collection of curios of almost every kind, and in order to obtain the address of every *live* collector I am selling at *actual cost*. Every specimen guaranteed absolutely perfector money refunded.

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Nurse shark egg.....	36
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Key hole Urchin.....	23
Sea Biscuit.....	23
Sea Fan.....	12
Club spined Urchin.....	19
Acorn Barnacle.....	9
Mammoth Cala. Urchin.....	20
Spined Urchin Atlantic.....	19
Large Tarpon scales.....	9
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Mounted Horned toad in box.....	69
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" Scorpion in box	35
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Stalactite from Arizona.....	05 to 50
Azurite and malachite beautiful blue and green minerals, found in an Arizona mine	10 to 50
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Any of the above will be sent *prepaid* upon receipt of price. Address,

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Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

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Exhibit at World's Fair Received Highest Award

36 of these Famous Gems postpaid for only 72c. Every purchase of this popular collection will be presented with a handsome glass tube containing 10 Microscopic Crystals, absolutely perfect, and so very small, that it takes 11,000 to weigh one ounce. This collection will surely please you. Your money will be cheerfully refunded if not satisfactory. Order to-day.

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VOL. I. No. 2. ALBION, N. Y., FEB. 9, 1895. Weekly, $1.00 a year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

WANTED. Indian relics, foreign copper coins, specialities. Swedish and Canadian; C. S. A. and State issues (war period) paper money, &c in exchange for duplicates in my collection. ERWIN G. WARD, Palmer, Mass.

EXCHANGE.—"Popular Geology" and "Footprints of the Creator" by Hugh Miller, "Sea and Land" by J W. Buel, "Forest and Stream Bird Notes" by Bailey. J. M. KECK, Mentor, Ohio.

WANTED.--Back numbers of *Auk*, works on entomology, botany, and ornithology. Can exchange Latin authors, Princeton Review for 1883, magazines, scientific and theological books. J. M. KECK, Mentor, Ohio.

WANTED.—To collect sets and singles of this locality for sets and singles of other localities the coming season. Write for particulars. A. A. WARNER, Roca, Nebr.

TO EXCHANGE —Stamps, books, papers, etc for Indian relics and minerals. Fossil fern prints, polished woods and botanical specimens in summer, for same as above. MURRAY EAST, DuQuoin, Ill.

ZOOLOGICAL Report of U. S. Pacific Coast Survey to exchange for works on Oology or Oological specimens. CLYDE L. SMITH, Noble, Ills.

WANTED.—A Coues' Key or Ridgeway's Manual. Will pay cash or give good exchange. Write stating condition and lowest cash price. ROBT. W. HAINES, Box 125, Baker City, Ore.

TO CLEAN out our datas we offer them at 20c per 100. $1 50 per 1000 A quansity exchanged for A 1 eggs with data. G. W. BAILEY, London West, Ont.

WILL collect nice sets this season at ½ cat. rates. Those desiring me to collect for them address me at once. All sets well prepared. R. N. WILLIAMS, Tallahassee, Fla.

A. B. DUMOUCHEL, Collector of Birds, Mammals and Eggs. I solicit correspondence from reliable collectors from all parts of U. S. and Canada during collecting season. Address 295 St Hubert St., Montreal, Canada.

WANTED.—Bird skins from California and Texas in exchange for skins of New Jersey. Also have shells, minerals, insects and curios to exchange for specimens. FERDINAND W. KNOLHOFF, 30 Winans St., East Orange, N.J.

MICHIGAN Lepidopterists.--Will all such and all Michigan Zoologists interested in the problems of faunal distribution, please send their address to ROBT. H. WOLCOTT, M. D., 133 Clinton St., Grand Rapids, Mich ; temporary address, University of Nebraska, Lincoln, Neb.

A MEMBER of the *New York Genealogical Society* and *the Methodist Historical Society;* for a moderate compensation would search church, probate and other public records to establish family lineage, etc. Address, DANIEL H. CARPENTER, Maplewood, N. J. 1-4t

WANTED.—Coues' Key, latest edition, in good order. Have telegraph instrument, eggs in sets and singles, minerals, Buffalo horns and curios. Will give good exchange. H. H. SHAW, 413 8th Avenue, Grand Forks, N. D.

BALD EAGLE IN MEAT, perfect condition. procurred Feb. 7th, third year's plumage, no broken bones nor bloody feathers. Parties meaning *business* address *at once*. L. V. CASE, Geneseo, N. Y.

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WANTED.—Polished specimens of emerald, agate, white and green, stripped, banded or fortification. C. L. HOWES, Stamford, Conn.

TO EXCHANGE.—500 *Strombus, alatus*, shells, flint lock gun, $10,000 in Continental money, Revolution bayonet. Want works on natural history, specimens, etc. A. BENNETT, Williamsville, Mass.

IDEAL BICYCLE Chain Lubricant solves the problem. Big money for agents Sample stick 10 cents. ROLPH & HATMAKER, Albion, N. Y.

GOLDEN SEA SHELLS sent postpaid for 25cts. a hundred. Pretty to trim curtains and lambreguins with. Send to A. D. AYER, M D., Lock Box 407, Madison, Conn.

TO EXCHANGE.—Birds' skins for eggs in sets with data, or marine shells, Send your list and receive mine. MRS. H. K. SEDGWICK, Dexter, Mich.

WANTED.—Collectors and taxidermists, who will use a number of birds and mammals in the meat, during the coming spring to send for my new list. FLOYD T. COON, Milton, Wis.

TO EXCHANGE.—Land and fresh water shells for same, or bird skins JAMES W. BROWN, Giddings, Tex.

WANTED.—One volume of "The Young Shipbuilders of Elm Island. Apply, H.F. EASTER, Sewanee, Tenn.

WANTED.—Coues' Key, latest edition, also a few Colt's powder and ball revolvers, not less than 38 calibre. All must be first-class. Will pay cash. REGINALD G. PAPE, McLeansboro, Ills.

TO EXCHANGE.—Books (cloth bound), old coins, specimens and birds' eggs, for fossils or minerals, or books on Taxidermy. ERNEST GROVE, Box 701, LeMars, Iowa.

VITÆ ORE will cure diptheria. And for all chronic ailments this mineral has no equal. Address, W. A. Perdew, Agent, Chillicothe, Ohio.

WANTED.—Catalogues of all firms dealing in shells, curios, minerals, etc. Also samples of publications. Address, HARRY H. ELLS, Charlotte, Mich.

WANTED. — Small cabinet with drawers, mounted Blue-bird. Have in exchange skates, stamp, 24 in. safety, and stamp collection. A. G. DOVE, Geneva, N. Y.

FIRST-CLASS birds' eggs in sets with original data wanted. Address ROY HATHAWAY, Red Key, Ind.

TO EXCHANGE—Sets and singles of this locality for eggs of other localities. I prefer common eggs in exchange. ROB'T A. TOMLINSON, Alden, Iowa.

WANTED —Eggs in sets with data. Will give in exchange a lot of good story papers, a small printing press, eggs and skins. O. W. KNIGHT. 157 Hammond St, Bangor, Me.

TO EXCHANGE.—A large variety of eggs in sets or singles, all first-class. C. H. HEDLEY, 584 West Ferry St., Buffalo, N. Y.

WANTED.—Eggs in sets, minerals, curios and U. S. stamps for *Polyphemus* and *Cecropia* cocoons. What offers for a No. 1 kodak with carrying case? R. V. N. DAVIS, 55 Park St., Rutland, Vt.

FOR EXCHANGE.—$6.00 worth of good stamps in Scott's Album for minerals or shells. Send list to HARRY C. SIMONS, Oak Lane, Philadelphia, Pa.

STAMPS.—100 all different, Japan, Mexico, &c., 10cts.; 100 mixed, 5cts.; 800 assorted, 50cts; 10 fine stamps and 500 hinges, 25cts ; 18 French colonies, 25cts.; 20 Spain, 30cts.; 16 U. S. 30cts. Postage extra. H. F. BUTLER, Newton Highlands, Mass.

TO EXCHANGE.—A World Type Writer in fine black walnut case, new, cost $17 50, for best offers. ALBION CARD WORKS, Albion, N.Y.

TO EXCHANGE.—Silurian, Devonian, Carboniferous, and Cretaceous Fossils to exchange for fossils not in my collection. Send lists of what you have and receive mine. R. D. GOSS, Box 101, New Sharone, Mahaska Co., Iowa.

WANTED.—No's 16, 17 18, 19, and 20, of Animated Creation, published by Yelmar & Hess, for a No. 1 Baltimorean printing press ERILE MORTON, 517 N 2d St., Leavenworth, Kans.

TO EXCHANGE.—500 varieties U. S and foreign stamps, and birds eggs. For minerals, shells, curios, of all kinds. JUSTIN V. BIRD, Gregory, Livingston Co., Michigan.

TO EXCHANGE.—Fine mounted Loon in ebonized case, complete, for best offer in eggs or skins over $12. A. W. HANAFORD, 139 West Fulton St., Grand Rapids, Mich.

EXCHANGE for Indian relics, curios, and minerals: 47 birds eggs of birds of New York State. Send your list and get mine. LEE-ROY J. TAPPAN, Newark Valley, Tioga Co., N. Y.

WANTED.—A Coues' Key in good condition. Will give in exchange $15 worth of first-class sets. H. W. CARRIGER, Sonoma, Sonoma Co., Calif.

WANTED.—All live and energetic collectors in Ornithology, Oology and Conchology, to correspond with me in regard to exchanging during the coming season. C. C. PURDUM, 110 W. Mulberry St., Baltimore, Md.

TO EXCHANGE.—First-class sets and singles with data to exchange for same. J. W. HITT, 169 Broadway, Indianapolis, Ind.

TO EXCHANGE.—I would like to exchange eggs of this locality for others. Have got a lot of type, reading matter and other things to exchange. GEORGE SINGLEY, 26 West High St., Lockport, N. Y.

TO EXCHANGE.—Sets and singles of this locality, for same of other localities. Collection of U. S. postage and revenue stamps for all sets with data. CLARENCE HARTINGER, Alden, Ia.

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FOR SALE OR EXCHANGE.—Peacocks and peahens, separate or in pairs. Fine young birds in full plumage. JOSEPH FAIRHALL, Grape Creek, Ill.

WANTED.—To buy a few "glass snakes," (*Ophisaurus ventralis.*) alive and uninjured, and to learn anythidg you know of them. ANGUS GAINES, Vincennes, Indiana.

FERRETS.—I have nine first-class ferrets, which I will sell at the following greatly reduced rates: Will carefully box and ship by express at purchaser's expense: Single ferrets, each, $2; pairs $3.50; three for $5; four or over $1.50 each. Address, enclosing P. O. Money Order; HENRY CLARK, Gaines, Orleans Co', N. Y.

FOR SALE —$150 pneumatic bicycle. Will sell for $50. Write for particulars to RUPPERT HENRY, 619 Mulberry St., Rockford, Ill.

FOR EXCHANGE.—One pair of unused Latin's climbers, for best offer in sets with data or books on Oology. Address, IRA CLOKEY, Decatur, Ill.

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$75.00 will buy a new 20lb Raleigh bicycle, suitable for road or track use Write for particulars. JOHN J. KINGSLEY, 10 Elm St., Rutland, Vt.

I HAVE two of Mekeel's blank stamp albums almost new, cost $8, to exchange for fine sets or books on natural history. GEORGE D. FRENCH, Ivoryton, Conn.

TO EXCHANGE.—United States and foreign stamps for eggs in sets or singles. H. J. EVANS, Unity, Maine.

WANTED.—Minerals, fossils and shells. Can offer for same magazines, sets and printing to order. Send for samples of printing. ROY CRIHFIELD, Atlanta, Ill.

GOOD SPECIMENS, Cone-in-cone from Chautauqua County, N Y. 25 cents each, postpaid. B. J. HATMAKER, Albion, N. Y.

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Instructions and Material, 75 cts.

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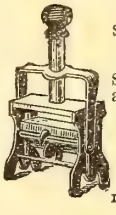

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Rochester	5:55		8:00	10:30	2:20	5:35	10:00
Albion	6:50	7:00	9:00	11:35	3:25	6:50	11:06
Lockport		8:05	10:00	12.22	4:20	7:40	12:00
Susp. Bridge		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo	6:35		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:10	1:40		5:50
Susp. Bridge	6:45	8:10	11:20	1:48		5:55
Lockport	7:30	8:50	12:00	2:25		6:35
Albion	7:05	8:20		1:00	3:25	6:45	7:55
Rochester	8:05	9:30		2:05	4:40		9:00

65 SPECIMENS **$1**

20 Minerals, assorted; 20 Stamps, assorted; 10 Fossils, assorted; 5 Arrow Points; 3 Mammoth Cave Specimens; 1 Old Coin; 1 Confederate Bill; 1 Gem Stone; 3 small Rubies; 1 piece Petrified Wood; 1 Petrified Coal Nut. 1-2t

Larger lots can be furnished. Address,
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CHEAP SKINS!

Ruby-crow'd Kinglet,	13c	Intermediate Sp'w,	10c
Purple Finch,	10c	Audubon's Warbler,	15c
Bush Tit	10c	Yellow Warbler,	9c
Ark. Goldfinch,	10c	Oreg. Junco,	15c
Sam'l's Song Sp'w,	10c	Cedar Waxwing,	8c

W. Golden-crowned Sparrow, 15c.

The entire lot sent post-paid for only $1.00. List of other skins and mounted birds free. 2-5t

F. T. Corless, Los Catos, Calif.

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Natural Science News.

VOL. I ALBION, N. Y., FEB. 9, 1895. No. 2

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

At date of going to press NATURAL SCIENCE NEWS has fully 675 subscribers—dozens and perhaps hundreds more are blockaded en route.

The advertisers of NATURAL SCIENCE NEWS, its Publisher has reason to believe, are not only strictly reliable, but are leaders in the various lines which they represent.

The Publisher of NATURAL SCIENCE NEWS will give $5.00 cash for an accepted design for heading to the first page of this paper. This heading must occupy about 1½ or 2 in. by 6½ in. space and be of the style used in the *Youths Companion*. All designs must be in not later than March 20th.

An Eskimo Robe.

Messrs. Schoverling, Daly & Gales have on sale among their novelties a curiosity in the shape of an Eskimo Robe. It is made of the skin Eider ducks, the feathers plucked leaving simply the down attached to the skin. The back is made of female skins while the top is made of male skins. The border is from the heads and necks of the male. To secure the birds, to skin them, to tan the skins and put them together in this unique way requires months of continued labor. A single robe represents the work of a whole family—father, mother children, relatives and friends—for a season. This is the warmest fur known to the Arctic explorers. It is valued at $200.00.—*The Sporting Gazette*, Syracuse, N. Y.

Study of the Natural Sciences Encouraged by the Government?

Hon Wm. E. Curtis the able Washington Correspondent to the *Chicago Record* tells the following good story:—

"He was a polite negro, with a large eye expressive of a natural flow of language and a face as black as a raven's wing. He wanted to see Congressman John Allen of Mississippi and sent in his card at the west lobby door. In due course of time the member came out. He cast a piercing look at the sender of the card, who approached him with an obsequious bow, holding his hat in his hand.

"Sah," said the colored man, with a bland smile, "I is one of yah constituents. Brown is my name—Hiram Brown, sah."

"Ah," said the congressman, bowing stiffly, "what can I do for you?"

"Well, sah," said the darky, "I wants to git a government position, sah, if yah will kindly lend me yah valyble ahsistance, and I come all de way to Washington to see yah about it sah."

"Oh, indeed. Under the civil service or what?"

"I doan't kyah, sah, whether it's under the sahvice or not, just so I git a good and reliable appointment, sah, whah I can sappote myself wid becomin' dignity."

"Do you know anything about physiology, meteorology, conchology or biology? Can you go back to the paleozoic age and demonstrate in technical terminology the anthropology, fauna or zoology of that epoch? Can you disect the pterodactyl or the icthyosaurus or prepare a scientific repast of one of the pachyderms of the glacial period? Can you reconstruct for the edification of a profound professor of buggology the bibacious saurians that were seen by early navigators in the dim dawn of the brazen age?"

The darky stepped two paces to the rear and stared.

"I say, can you do these things off-hand on cross-examination, without drawing a breath or stopping to think?" continued Allen. "If not, go back to your district and pray for the return of another era of democratic sovereignity, with a president pledged to the repeal of the civil-service act."

Hiram had been listening with open-mouthed astonishment, and a look that settled into an expression of deep awe. The sweat broke upon his ebony countenance. He slowly pulled a red bandana from his coat-tail pocket and wiped his reeking brow as the congressman paused.

"I—I—guess, sah," he stammered, with an embarrassed smile creeping back into his face, "I guess, sah, dem queshuns is specially intended foh young cullud pussons dat hab got dar edycashun in a college. I was bawn too soon."

And he walked away with a profound salaam, showing his respect for superior learning, while Allen resumed his congressional labor with a stern look of duty.

From Burrough's "Riverby."

The scientific habit of mind leads a man to take into account all possible sources of error in such observations, the senses are so easily deceived. People of undoubted veracity tell you of the strange things they have seen. But if you question them closely, you are pretty sure to find some flaw in the observation, or some link of evidence wanting. We are so apt to jump to conclusions: we take one or two steps in following up the evidence, and then leap to the result that seems to be indicated. If you find a trout in the milk you may be justified in jumping to a conclusion not flattering to your milkman, but if you find angleworms in the barrel of rainwater after a shower, you are not to conclude that therefore they rained down, as many people think they do. Or if after a shower in summer you find the ground swarming with little toads, you are not to infer that the shower brought them down. I have frequently seen large numbers of little toads hopping about after a shower but only in particular localities. Upon a small, gravelly hill in the highway along which I was in the habit of walking I have seen them several seasons, but in no other place upon that road. Just why they come out on such occasions is a question; probably to get their jackets wet. There was a pond and marshy ground not far off where they doubtless hatched.

Geological Collecting.

By Ulysses R. Perrine.

We often see people in their leisure hours, wasting their time away in frivolous pursuits when in the way of collecting and studying the objects of nature, which are scattered in such profusion on every side—they might add to their education by the perusal of "Nature's story book."

A collection once started may not advance as fast towards completion as we might wish it to but even imperfect as it may be it will always be a collection of souvenirs of the present as well as relics of the past.

Each specimen may have scores of little reminiscences attached to it. Here for instance in our cabinet is a *Delthyris* with its well written history of past glory. What wonderful things might it tell if it could speak of how it spent its life in some snug nook at the bottom of the old-time ocean, surrounded on all sides by the marvelous life of tropical seas, hemmed in at the north by desolate mountains while to the south spread the unbroken expanse of a shallow ocean.

Now besides the recollections of the past that envelop this little mollusk, there always clings to it too the remembrances of a delightful summer excursion to Old Fort Erie in Canada. And so it is as we go, so may we collect and be well repaid for so doing. Every picnic or excursion that we may "take in" we may always find something new in the way of specimens.

In this part of the State the popular place for summer picnics is along the shores of Lake Erie; the cliffs of this shore for many miles are of those rocks which belong to the Hamilton group, and coupled with this is the fact that there are numerous detached boulders of the Upper Helderberg period (brought down from the northward in the Glacial period) thus making it a fine collecting ground for the student of geology.

How could a collector place any value in dollars and cents on specimens found on such occasions with their halo of pleasant incidents which invest them and recollect the pleasure with which he traversed the shore of a fresh water lake of today, directing the strokes of his obedient hammer on the rough side of a suspicious looking boulder and then as the rock-pages broke asunder the curious delight of gazing on forms that mortal eye had ne'er gazed on before!

How in the wondrous profusion with which the ocean forms of a long-ago age strew the shores of this great lake of today, do the old and new so strangely meet. And the shells that had their being millions of years ago, then sealed in their rocky tombs to be found again and rescued by the relentless waves of Lake Erie and cleansed and polished anew by her waters, she placed them before us side by side by her own product, the fresh water shells of today.

Let some of our skeptical scientists try to find that the rock record is antagonistic to the masonic record if they wish, but the deeper the unprejudiced mind delves into the enduring records of nature the firmer will be the conviction that the world and "all living things depend on one everlasting Creator and Ruler."

Let the editor of the *Popular Science Monthly*, and all others who may contemptibly cry out "Back to Dogma" when a true scientist may testify to the belief in the existence of an inteligent and designing Creator we will still believe that the "existence of a first cause is the creed of reason."

And like as these beautiful forms, venerable with years, are born by the never tiring waves of Lake Erie from their honored tombs to feel the rays of a sunlight that has not kissed their pearly forms for countless ages, so does the greater share of students believe that the One who ever rules, all this, will rescue the human forms of our age from "Time's remorseless sea," when

"Dawns the day that will never know declining."

Crytochiton Stelleri.

I was coming back from Point Defiance with a basket of shells upon my arm when I was stopped by a good looking boy about twelve years old with a, "Will you please tell me what that very curious animal is, which you have there in your basket?"

"Certainly, my boy. That fellow has a real easy name to remember. We call it a *Cryptochiton Stelleri*."

"That is worse that botany," was his prompt rejoinder. "Hasn't it an easier name to remember?"

"Yes; you may call it the giant chiton (ki-ton,) if you like. But the other name is not so bad when you know its meaning. Chiton means a coat-of-mail, such as the knights of olden time wore. See these eight shells along the back of this small chiton, one shell overlapping the other like a flattened back-bone. This is his coat-of mail which gives the chiton his name. You see the giant chiton has his eight shells just the same as his smaller brothers only his coat-of-mail is hidden by this tough, brick-red skin, or mantle, which completely covers the tops of his shells. So we call him a *Cryptochiton* or hidden-coat-of-mail."

"But you had more to his name than *Cryptochiton*—if that is right."

"*Cryptochton* is his surname, like Smith, Brown or Jones. His other name, which is like your first name, although it comes last, is *Stelleri*. It was named after a man just as babies are named after Cleveland or Harrison. Shells are often (and foolishly) named after the the man who first describes them, or after some friend of his."

"And was this one named after its discoverer?"

"I think not. It was named by a Dr. Middendorf, whose writings about the shells of this coast were published in Russia about 70 years ago. Would you think that this giant chiton was a near relative of of those limpets which are so common on the rocks?"

"They do not look much alike." said the boy.

"Yet the animals are very much alike, although their shells are so very different. The limpet has but one shell, shaped like a conical cap, and the chitons have eight shells, each of which look a little like the two wings of a butterfly. Chitons move about even more slowly than the limpets. These big fellows are rare and are found only at very low tide. I have found only four this whole summer."

"I never have found one," said my young friend, holding the chiton in his hand to feel of its hidden shells. "I don't see how a fellow could help seeing so big a one as this though."

I shook my head and smiled.

"They lie next to the sand against some jutting rock, and this was passed unseen by a dozen people before I saw it. An animal which moves slowly is seldom conspicuous unless it tastes badly, which this does not. The limpets are eaten by a great many people, and millions of them are used every year for fish bait, on the coast of the British Isles. Now the chitons

are probably somewhat tougher than the limpets, but are edible. So, as they are also slow-moving they must be protected from their enemies by their position on the rock and their resemblance to the rock.

"Can the chitons see?" inquired my young inquirer.

They can distinguish the light, but they have no eyes. You see this limpet has two long pointed horns, or feelers, and there is an eye at the base of each of these horns. But the chiton does not have these tentacles, and has less variety of food on that account."

"What is their food?"

I silently pointed to the marine plants which covered the rocks on which some limpets and chitons were living.

"There seem to be three or four kinds of chitons," said the lad,

"About 250 species," I remarked dryly. "We have at least 25 kinds along this coast of the United States, and there may be more."

"They do not seem to fear being washed away by the waves."

"O no! They like to live where the waves beat the hardest. It is safer there from their enemies. They have a funny fashion of curling themselves into little round balls protected by their. armor, when they are pulled off the rocks. It is sometimes troublesome to get them to lie straight when you are preparing them for the cabinet."

"How do you fix them so they will be nice to keep?"

"I cut out the soft fleshy part with my knife—thus. You see I leave the leather mantle which runs around the body, uncut. Some people bind them upon a board until they are dead and will not contract any more. I do not boil them as I do most other shells, for they will come into eight pieces."

"How big is that fellow you have in your basket, the boy asked.

We measured it and found it to be more than eight inches long and about half as wide.

"It looks somewhat like a cradle," sai dmy young friend.

"Some people call the chitons "sea cradles," but I think it is just as well to learn the proper name for a shell at once, and then you never need to learn a new name."

"And what would this one be worth to sell.

"If you were to buy it from some Natural Science Establishment you would have to pay $1.50 for as fine a specimen as this. Possibly you might sell it for a dollar."

"I think I shall go to studying shells if I can pick up a dollar that easy upon the beach," said the boy.

"My dear boy, you would pick up more than a dollar if you really studied the shells you gathered. The worth of knowledge is not to be measured by what its dry shells bring. It is the training you give your observation, your reason and your habits, that is the valuable reward of natural history studies, and not the dollar you may get for a fine *Cryptochiton Stelleri.*"

"I want to go with you if you go after shells to-morrow," said my young friend, quite eagerly, "and maybe I, too, can find a giant chiton." C. M. Drake, in *Northwest Journal of Education.*

Largest Gold Nuggets.

The records of the Smithsonian Institute furnish a list of the largest gold nuggets ever found in the world, and are as follows:

"King of the Water Moon," found in Australia in 1852; weighed 223 pounds and 4 ounces.

"Welcome," found at Ballarat, Victoria, Australia, 1854, 184.10 ounces. "Bakary," found at Carson Hill, Cal., 1854; weighed 180 pounds; and another at the same mine and year weighed 149 pounds. The two were the largest gold nuggets ever discovered in America. The "Corona," found in Toulumne County, California, 1850, weighed 147½ pounds. The "Farnish," found in 1860, at Sierra Buttes, Cal., weighed 133. There was one found in the same place, 1869, weighed 95 pounds 6 ounces. "Great Siberian," found near Miosh, Siberia, 1842, weighed 96 pounds 4 ounces.

In 1853 the famous Ballarat mine of Australia, mentioned above, yielded three nuggets which, combined, weighed 357 pounds.

"Blanche Barclay" nugget, found in Australia in 1842; weighed 146 pounds.

The nugget of largest size ever found east of the Mississippi was taken from the Reed mine in North Carolina. It weighed even 80 pounds.

"Rattlesnake" nugget, discovered in Rattlesnake river, California, in 1871, weighed 106 pounds 2 ounces.

Meroo Creek mine, New South Wales, produced three nuggets during 1851, the combined weight of which was 318 pounds.

Florida Cruising.

By Eugene Pericles.

Of all delightful experiences in the way of winter pastimes, the most pleasurable to me is that of cruising about on the rivers of the South. It has been my good fortune to float down several streams at the North, and it has appeared that this method of collecting is equal to any other; but a northern trip, among birds with which one is familiar, fades into insignificance when compared to a river trip in Florida. Here one is continually meeting with strange sights, while the special features of interest to a collector of birds and eggs are constantly presenting themselves.

The Indian river, on which I spent several weeks at different times and trips, is visited by the Ducks of the North which winter here. At times one might say that the so-called river is covered by one mighty flock of Ducks, for, so closely together do these flocks come, that at a little distance it appears as if there was one continuous flock as far as the eye can see. The principal kind of Duck in the flocks is the Lesser Scaup, in fact there are hundreds of this species to any other kind of Duck in the state, or at least it is so on the salt water lagoons. In these large flocks of Lesser Scaups, or Little Blackheads or Blue-bill as they are more generally called, there are some Big Blue-bills or American Scaups. These flocks of Blue-bills are so dense and extensive that I have seen a steamer on the river constantly scaring up detachments of flocks for miles. For miles and miles in January and February the river is covered with them and many may be seen within gun-range at once. Of the other Ducks, there are Mallards, Teal, Pintail, Widgeon, Shoveler and Black Ducks and the Buff-breasted Goosander.

The common "Hell-driver" and familiar Loon of the North are also seen both on fresh and salt water. Kingfishers and Spotted Sandpipers dash out from, log shore or snag as at the North. Killdeer Plovers remind us of home, while Hermit and Brown Thrush, Catbirds and Robins, the last in thousands are all here.

Among the Herons are the Great Blue, Little Blue, White, Snowy and Louisiana. The change of color in the plumage of some of these birds makes it difficult to identify immatures at times. The Louisiana, Great and Little Blue Herons breed abundantly, and were nesting in vast heronies in isolated places about the middle of March.

As an indication of the advancement of the season I would record that several young Bald Eagles, nearly full

grown, were taken from the nests in February, while I saw two nearly full grown young Pelicans swimming about on March first. On March third two Sandhill Crane's eggs were taken which were about to hatch. The nest was placed on the ground and was composed of coarse weeds and very loosely put together.

There are great numbers of Gulls and Terns here, but as I am from an interior section of the North these birds cannot all be identified by me. The American Herring, Ring-billed and Bonapartes' Gulls and the Royal, Least, Black and Common Terns were seen.

Cormorants and Pelicans are to be seen everywhere in the neighborhood of salt water, while the Darter or Water Turkey (Anhinga) is found both in the lagoons as well as on the fresh water. One collector could take a thousand Brown Pelican's eggs in a very short time. The main trouble in collecting them is in the blowing, which is not a small undertaking, and the trouble of transporting so bulky a load.

Plume birds are scarce and getting scarcer. There are still plenty of White and Snowy Herons but they are very shy. I have seen flocks of these persecuted birds rise when we came in sight of them. In a three months trip I have failed to see a single Roseate Spoonbill. They are becoming rare excepting in the wilder parts of the interior.

At Jupiter I met Billy Bowlegs, a direct descendant, son or grandson of the historically celebrated Seminole of the same name. Billy was selling Heron's plumes to the dear ladies, who are ever ready buyers. Around his head were wrapped one or two small shawls, a lot of ingrain carpet and a variety of other material. The whole turban being quite seven inches high and fully twelve inches in diameter, and was held together by a big shining band. The headgear must have weighed fully six or seven pounds, and it was surmounted by a White Heron's plume. His ears had large rings in them and for neck-wear he had six differently colored gaudy handkerchiefs surmounted by a cheap four-in-hand tie. Three shirts, the outer one being shortest, in order to show the colors below, and none of them too long, constituted his sole body wear.

Billy was right in style with the ladies, as he had the sleeves of the outer gingham shirt puffed, puckered and tucked up to beat all. But though so elaborately dressed above, I must record that Billy Bowlegs was clothed with very scanty dressed leather leggings which but partially concealed his bow (?) legs.

Of the Rail family I have met with the Sora and American Coot only. The Purple Gallinule is not common that I can learn, but I expect to meet with it in the interior. The habits of the Turnstone interested me and the peculiar ways of this pleasing bird were subject for much observation. The Florida Bob-white is slightly smaller and of a darker color than its northern relative. In fact this rule generally obtains, that southern varieties of birds and mammals are smaller than those of further north. Do not understand me as giving this as a fixed rule, for I am well aware that the Fox Squirrel here is a half larger than the northern representative. However the Gray Squirrel and Deer are much less in size here than at the north.

Wild Turkeys are brought into the little settlements by the white and Seminole hunters every day, as is also a plenty of venison and many other kinds of game and a great variety of fish. At one place at which I stopped we caught fourteen kinds of fishes and all of them were good for food. The fishing resources of Florida are unlimited, and the pleasure which an angling tourist may secure from a winter in the state is great.

One of the most interesting birds in the south, is that unassuming, unsuspicious, loveable little creature, the Ground Dove. The first time I ever saw it I was pleased with its ways and after an acquaintance of several years I am still more favorably impressed by its demure manners. It nests here abundantly, laying two small white eggs of the regulation Pigeon shape. The Mourning Dove is also here but is rare compared to the Ground Dove in quarters that I have visited.

There are Turkey Buzzards everywhere, and it is rare to look about the heavens without seeing from one to a score of birds. Black Vultures are seen only in certain quarters and are unknown in some sections. When these birds take possession of a locality, the Turkey Buzzards are driven away and kept away. If any of your subscribers can furnish authentic notes on this subject I should be glad to hear.

The Marsh Harrier is here and is to be seen sailing low over the Savannas. The Red-tailed and Red-shouldered Hawks are found, the latter, a Florida variety, nesting plentifully. One nest was in a Palmetto and only twenty-two feet from the ground. This Hawk is as noisy here as at the north and its nest can be easily found. I saw a pair of Swallow-tailed Kites sweeping about in the air. The evolutions are remarkably graceful and yet combining dash and rapidity in their movements. There are any quantity of Bald Eagles in this state and they are pleasing and powerful flyers. It is difficult to realize how swiftly an Eagle is flying unless one is close by when a dash is made. Sparrow Hawks are not rare and I met with one Duck Hawk. Two Owls, the Florida Barred and Barn Owl are the only ones I have met with as yet. The latter is called the "Monkey-faced Owl" here.

Of the Woodpeckers I have only met with three on this trip, namely the Red-bellied, Flicker and Piliated, all of which inhabit the palmetto scrub thickets, however the latter is not as wild as it generally is at the North and I have repeatedly worked quite close without alarming it.

The Chuck-wills-widow is common here and tunes up generally on its arrival from further South about the middle of March. It is called the Whip-poor-will by all settlers who have moved here from the North The notes certainly do have the same kind of a piercing chuckle to them, yet to an educated ear the difference is marked.

Our common Pewee is here, also the Crow and Blue Jay, though the two latter are now acknowledged to be varieties. There is also the Florida Jay, which is commonly known here as the "Scrub Jay" from its preference for thickets.

There are many Grackles here; and reasoning that a bird should become a variety when its notes are different from another species or race, then the Florida Grackle certainly is entitled to distinction. For the stridulous notes of this Blackbird are entirely different from the Bronzed Grackle's efforts.

This letter is already too long, and with remarks on a few well-known species I will close.

The Carolina Wren is a pleasing bird. It sings plaintively and in a variety of strains, and its notes can be compared with those of the Robin. The Yellow-rumped Warblers and Cardinals are ubiquitious here in winter, and with the Mockingbirds are the life of the glades. There are White-bellied Swallows in myriads. Among the Warblers are the Chestnut-sided, Yellow-throated, Prairie and Oven-bird.

Perhaps this letter will fail to please many of your readers as it does not record the taking of eggs, but it must be remembered that the season has really not opened fairly. Very few species besides the Heron's, Pelicans and other water birds, and Hawks have begun to nest at the time this is written.

There is a pleasure in sailing about, even if one cannot take many rare eggs. I shall always remember my trips on the Indian, Sebastian and Loxahatchie rivers, and the connecting lagoons as the most agreeable days spent in Florida among the birds.

I would like to describe our boat and how we sail, fish, eat and sleep, and a hundred features of a cruise, but this will be postponed.

Kind Words for the OOLOGIST and NATURAL SCIENCE NEWS.

I am glad to hear that the NATURAL SCIENCE NEWS is about to be published. There seems a great need for a cheap weekly paper in that line, with Want, Exchange and For Sale column, which will help beginners to take an interest in collecting the objects which surround them. The *Popular Science News* only comes out monthly, and is too much advanced for young collectors. I enclose a dollar for my subscription to NATURAL SCIENCE NEWS. M. J. Hallet, Merle, Calif.

I am sure the NATURAL SCIENCE NEWS will be a great success. Cha's White, Glencoe, Neb.

I know the NATURAL SCIENCE NEWS will contain good reading matter for a collector. I wish you and both your papers a successful year. W. L. Foxhall, Tarboro, N. C.

I trust that you will have the same success with the NATURAL SCIENCE NEWS as with the OÖLOGIST. The OÖLOGIST is without a doubt, a nice paper, and I have a kindly feeling for it; and if you ever hear of anyone running it down, just refer them to me. Wm. B. Gadsden, Savannah, Ga.

I have no doubt that the NATURAL SCIENCE NEWS will be a great help to those who are collecting, as was the OÖLOGIST to me. Wishing you great success with your new paper, I remain, F. G. Foster, Jr., Hamilton, Ont.

I could not do without the OÖLOGIST now, and it has my best wishes for its success. G. F. Dippie, Toronto, Ont., Can.

The OÖLOGIST is the best paper I have taken for years, and I would not be without it. I have never found anything to equal it, for its size and price. Wm. Frederickson, Eau Claire, Wis.

I send you enclosed $1 for NATURAL SCIENCE NEWS, and I can truly say that I wish you success in this your new venture, and if I can ever be of any aid to you, let me know. Floyd Coon, Milton, Wis.

I hope for your success in your new enterprise. Clarence Simon, Youngstown, Ohio.

I am always glad to hear from just such men as I have put you down to be and in regard to NATURAL SCIENCE NEWS, I think it is a good thing, and no Taxidermist should be without it. Geo. F. Steckrath, Middletown, Ohio.

I hope the undertaking may be as successful as I am sure it will be. M. M. Coon, Jefferson, Ohio.

Hoping a long and prosperous life to the NATURAL SCIENCE NEWS, I remain, Howard Hixon, Washington, Pa.

I congratulate and encourage you in the work. S. H. Miller, Thiel College, Greenville, Pa.

I enclose $1.50 for subscription to NATURAL SCIENCE NEWS and my renewal to the OÖLOGIST. I am very anxious to see the former, and I assure you, that you have my hearty wishes for your success. Nathan E. Reist, Lime Rock, Pa.

What is this I hear about some new venture in the literary line? NATURAL SCIENCE NEWS or something or other. Another Vol. 1, No 1, periodical I'll be bound. I trust it may have a much longer life than some Vol. 1, No. 1's I know of. The fact that you are behind it is sufficient guarantee for its success. I shall be much interested in this new journal and of course must have it. Enclosed find $1.50 worth of "stuff" for which please send me the NATURAL SCIENCE NEWS and the OÖLOGIST to Jan. '96. Neil F. Posson, Medina, N. Y.

You may list us as a subscriber of your NATURAL SCIENCE NEWS for the present year. Wishing you all success in your undertaking, I remain, Adolph Laux, Lockport, N. Y.

Wishing the NATURAL SCIENCE NEWS perfect success, I remain, Leonard D. Leach, Auburn, N. Y.

I don't see how I could have neglected to subscribe for your valuable journal. It is really better than any other "Ornith" Magazine published in America, with the exception of *The Auk*. Oscar B. Warren, Palmer, Mich.

I am very grateful that you should have selected me as one of your pioneer subscribers to NATURAL SCIENCE NEWS, and as I am interested in Science, especially in Geology, I take pleasure in subscribing. Frank Eldreds, Akron, N. Y.

I shall be glad to enlist as one of the first subscribers to the NATURAL SCIENCE NEWS. I feel sure that it will be an excellent paper, and well worth the price of subscription B. Green Boyd, Anson, Tex.

I don't want to fall in arrears for the OÖLOGIST, for I consider it one of the best papers that I read. W. Achilles, Austin, Tex.

Such a paper as the NATURAL SCIENCE NEWS, has long been wanted by naturalists, and wish you success with your paper. Guy Conley, Austin, Tex.

By chance today I saw one of your solicitations for advance subscribers for the NATURAL SCIENCE NEWS, and foreseeing the success that must attend the enterprise if properly pushed, and I feel confident that it will be, I want "to get my name in the pot." James W. Brown, Giddings, Tex.

I wish you every success in your new enterprise and will assist you in anyway that I can. Walter E. Iliff, Richmond, Ind.

I enclose herewith cash for subscription to NATURAL SCIENCE NEWS. We have no science paper now and I think it would be better to give up some other paper instead. W. Y. Russert, Laporte, Ind.

The proposed paper is just what I shall want. Best wishes for its success. W. A. Riley, Greencastle, Ind.

It is with great pleasure that I become a subscriber to the NATURAL SCIENCE NEWS. I feel that it is an excellent investment. I have not the least doubt that anything Frank H. Lattin is behind can fail to be anything but a grand success. Clinten H. Cary, New York, City.

Your paper will receive my support and co-operation for time to come. W. S. Colvin, Osawatomie, Kans.

Hoping your paper will be a success, I am sincerely, Harrison Sanford, Cheshire, Conn.

I shall be very glad to be one of the new subscribers to the NATURAL SCIENCE NEWS, and wish you success in your undertaking, and the new paper a welcome to all. J. M. Kilvington, Mason City, Iowa.

I presume the NATURAL SCIENCE NEWS will be a big help to me, although I am only an amateur entomologist. Have a friend who I think will subscribe also. H. T. Murphy, Tiffin, Ohio.

I hope you will have great success with your new publication. Willard B. Dobbins, Barnesville, Ohio.

The energy and honesty which you display in your line of work, is very hard to overlook. I wish you all success in your NATURAL SCIENCE NEWS. S. R. Hartwell, Waukesha, Wis.

Send me "THE paper on birds and eggs." I suppose you wonder why I give it that name, but in comparison with other papers on Ornithology and Oölogy, think it is *the* paper. Fred E. Pomeroy, Lewistown, Me.

I beg to enclose herewith an evidence of appreciation more substantial than mere words, and am glad to think that I may be one of those to assist in so good a work. Geo. H, Selover, Wabasha, Minn.

Enclosed find order for $1.50 for advance subscription to the NATURAL SCIENCE NEWS and also a renewal for OÖLOGIST. I find the woods are full just now of these publications, and if none of them are sublime, some come near reaching the other extreme. I have long since discovered that the average Yankee is either doing nothing, or else has about twice as much on his hands as he can attend to, and suppose that the latter is about the way it is with you. Frank H. Nutter, Minneapolis, Minn.

I heartly wish success to your new journal. Rev. P. B. Peabody, Wilder, Minn.

I have been longing for years for weekly Natural Science paper; am glad you are the man to enter the field. I hope it will prove a financial success, and am sure you will have the support of the advanced collectors, and to this end, enclose a dollar for subscription. Frank Harris, LaCrescent, Minn.

I have received my first OÖLOGIST and think it a good paper. If the NATURAL SCIENCE NEWS is as good as the OÖLOGIST I shall remain a subscriber. C. W. Prier, Appleton City, Mo.

Natural Science News.

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Geodes, size Hens eggs, of white Chalcedony, with frost and snow like crystals inside, 25 cents each postpaid. None finer. From So. Dakota "Bad Lands."

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Five fine "Bad Lands" Fossils, express paid	1 50
A beautifully exqusite set of pepper and salt shakes of Aluminum, satin finish and polished	1 00
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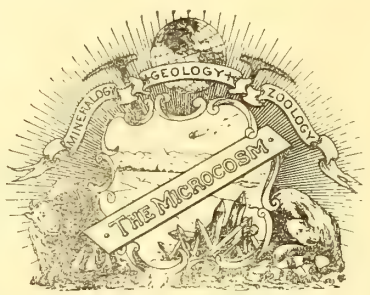

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Natural Science News.

VOL. I. No. 3. ALBION, N. Y., FEB. 16, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

WANTED.—A second-hand copy of Coues' Key or Ridgeway's Manual. Will pay cash for either book. State price and condition in first letter. D. E. DANBY, Center City, So. Dak.

WANTED.—Collections of eggs in sets, for which I will exchange minerals, fossils or Indian relics. Please send list and state rate at which you will exchange them, for goods listed at cash rates. GEO. W. DIXON, Watertown, S. D.

$3.00 BUYS 1 grooved axe, 1 celt, 1 gorget, 1 pendant, 12 arrows, 3 scrapers, 1 flint hatchet, 1 net sinker, and 3 war points. All good relics. Satisfaction guaranteed. A. L. GRUTZMACHER, Muskwonago, Wis. 3-2t

A MEMBER of the *New York Genealogical Society* and *the Methodist Historical Society;* for a moderate compensation would search church, probate and other public records to establish family lineage, etc. Address, DANIEL H. CARPENTER, Maplewood, N. J. 1-4t

MICROSCOPE sections showing normal structure of mammalian body—strictly first class, neatly stained, securely mounted, for sale cheap or exchange for books, supplies, &c. CHAS. B. WILSON, Johns Hopkins University, Baltimore, Md.

READ! READ!—To every person sending me a 50ct. piece, coined before 1875, I will give 1 000 foreign stamps; 25ct. pieces, same date, 500. Address, B. G. MERRILL, Hinsdale, Ill.

WANTED.—Taxidermists and Collectors to send for my price list of birds in the meat and fresh skins. Correspondence solicited. FLOYD T. COON, Milton, Wis.

COUES' KEY.—A second hand copy, in good condition for $5.75 cash. If wanted by mail, 34 cents must be added to pay postage. GEORGE E. BROWN, Hyde Park, Mass.

EXCHANGE.—Ferret, value $3. 200 Columbian stamps, Trip Around World, World's Fair albums value $3.25, for best offer in eggs. GEORGE QUIGSLEY, 15 West High St., Lockport, N. Y.

FOR EXCHANGE.—Coues' Key, Maynard's Naturalist's Guide, and Coues' Field Ornithology. Each in excellent condition, for camera, books, specimens, shells, etc. MOTT SPAULDING, Edinboro, Pa.

COLLECTORS having rare birds' eggs, singles or sets, either end blown, or 1st class specimens for sale cheap. Reptiles eggs also wanted. Please write to W. R. WHARTON, Germontown, Phila., Pa. o

EXCHANGE.—I will exchange (at Scott's prices) old Canadian postage stamps from the first issue, for Indian relics of all kinds. (Reference Town Bank,) W. S. FALLS, Amherstburg, Canada.

NOTICE.—I have the following singles which I will exchange for sets with data. A. O. U. Nos. 172a, 171a, 161, 559, 487, 373, 384, 360, 342, 359 Lesser Prairie Hen, 125, 118, 75, 74, 71, 72, 69, 70, 65, 58, 53, 51a, 31a, 30, 27, 10, 3, 301, 286, etc., etc. JOHN W. DANIEL, Bethel Academy, Fauquier Co., Va.

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INDIAN Relics of great value for sale or exchange. Addresses of collectors wanted. Interesting collection postpaid for 24c in stamps. THE ARCHÆOLOGIST, Box 502, Columbus, Ohio. 3-w4

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WANTED.—A Snowy Owl in the meat, preferred, might purchase a skin. Address, MRS. E. J. ALDRICH, Granby, Hampshire Co., Mass.

WANTED.—A Simplex Type writer, new or second hand. Will give in exchange, stamps and birds eggs, sets or singles. Send for list. W. J. WIRT, Box 137, Gaines, N. Y.

FOR EXCHANGE or SALE.—A 12 ga. Winchester Repeating Shot Gun in good order for $15; Maine Tourmourlines, either as specimens or gem material at good prices. D. E. MOULTON, Falmouth, Me.

EXCHANGE.—Microscopic slides for same. Slides or cash for unmounted *Trematodes* or parasitic Insects (good alcoholic specimens). Write, W. C. HALL, State Univ., Lincoln, Neb.

HEAD of thirteen foot alligator, fine skins and rare sets to exchange for folding canoe or cash. W. S. DICKINSON, Taxidermist and Collector, Tarpon Springs, Fla.

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WANTED.—Address of all hunters and trappers in the U. S. GUS STAINSKY, 124 N. Wahsatch Ave, Colo. Springs, Colo.

WANTED.—To exchange, eggs, Indian relics and bird skins for eggs in sets of other localities, Send lists and receive mine. CHARLES E. HUSK, Shabbona, Ills.

EXCHANGE.—Will collect local specimens in any branch of Natural History in exchange for desired eggs in sets. FRANK H. NUTTER, 710 Sykes Block, Minneapolis, Minn.

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TO EXCHANGE. "Bessey's Essentials of Botany," 292 pages, *new*, cloth bound, and "Injurious Insects of Kansas," a 100 page pamphlet, for best offers of other scientific works or natural history specimens. A. O. GARRETT, 1425 Kentucky St., Lawrence, Kansas.

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TO EXCHANGE.—Twenty-two volumes of "Harper's" 1872 to 1884 in pat. binders for "The Auk," Coues' Key or other works on Ornithology and Entomology. M. TAND Y, Dallas City, Ills.

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TO EXCHANGE.—An F. A. Barnes hand power rip and dado saw, nearly new, cost $75 for first class sets of eggs, books on Ornithology and Oology. Address H. W. BEERS, Bridgeport, Conn.

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WANTED.—Back-numbers of the *Auk*. W. S. JOHNSON, Box 228, Boonville, N. Y.

WANTED—Cocoons of the large moths, also *Lepidoptera* (in papers preferred), have in exchange, skins or cash. E. H. RICHARDS, Box 414, Woburn, Mass.

WANTED.—Rare land shells of this and other countries. Offered. Land, fresh-water, and marine shells. Send lists and receive mine. CHAS. S. HODGSON, Albion, Illinois.

I COLLECT shells and sea-mosses, snakes lizards, horned toads, small bird skins, butterflies moths, insects, and wild flowers. M. J. HALLETT, Merle, San Diego, Co., Calif.

WANTED.—A No. 1 or No. 2 Kodak in good order for field glass, rifle, skins, eggs, (full data) or cash. D. D. STONE, Lansing, N. Y.

WANTED.—Sets of Black Vulture, not Turkey Vulture, 25 cts per egg; sets of Audubon's Caracara, 50cts per egg, from original collectors. C. O. TROWBRIDGE, Farmingham, Mass.

BARRED OWL, nicely mounted, moth proof, $2.75; Blue Jay, 75cts, or will exchange for sets with data at half catalogue rates. JOHN CLAYTON, Lincoln, Maine.

WANTED.—Oregon bird arrow points in exchange for bird skins. E. S. MACGOWAN, 137 Western Ave., N., St. Paul, Minn.

WANTED.—First-class Woodpeckers' and Warblers skins, and book about Woodpeckers. Can furnish fresh skins and birds in the meat, and some desirable books. J. ROWLAND NOWELL, Anderson, South Carolina.

FOR SALE.—All kinds of North Carolina birds, also skins and furs for rugs, such as Deer, Bear, Wild Cat, Red and Gray Fox, Coon, Mink, &c., &c. N. W. FAIN, Taxidermist, Asheville, N. C.

TO EXCHANGE.—Land and fresh-water shells of Southern Wisconsin to exchange for the same from other localities, or marine curios. Polished *unios* furnished when desired. Send list and receive mine. Mrs. E. C. WISWALL, Kenosha, Wis.

TO EXCHANGE.—Fine specimens of gold, silver, copper and lead ores, and hat-racks made of polished horns, for U. S. and foreign coins and anything in the numismatic line. F. O. NELSON, 412 S. Main St., Butte, Mont.

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WANTED.—Fine Indian relics or cabinet specimens of minerals, will exchange minerals, fossils, books or Indian relics. Send lists. GEO. W. DIXON, Lock Box 381, Watertown, S. D.

WANTED.—Publications pertaining to Archæology and Geology for which I will give mineral specimens, shells, curiosities, etc. GEO. J. REMSBURG, 500 S. 4th Ave., Atchison, Kan.

FOR EXCNGE.—Four Audubon bird plates for a standard work on Ornithology, Coues' Key, preferred. Write for particulars. STEPHEN A. KROM, Plainfield, N. J.

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Albion	6:50	7 00	9 00	11:35	3:25	6:50	11:06
Lockport		8:05	10:00	12.22	4:20	7:40	12:00
Susp. Bridge		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo		6:35		11:00	1:30	5:00	5:50
Niagara Falls.		6 35	8:05	11:10	1:40		5:50
Susp. Bridge		6:45	8:10	11:20	1 48		5:55
Lockport		7:30	8:50	12 00	2:25		6:35
Albion	7:05	8:20		1:00	3:25	6:45	7:55
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Ruby-crow'd Kinglet,	13c	Intermediate Sp'w,	10c
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The entire lot sent post-paid for only $1.00.
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Geodes, size Hens eggs, of white Chalcedony, with frost and snow like crystals inside, 25 cents each postpaid. None finer. From So. Dakota "Bad Lands."

12 plain perfect Flint Arrow Heads,	$ .50
12 nice " " " "	1.00
6 fine " " " "	1.00
4 splendid " " " "	1.00
A fine War Club of the Sioux, express paid	$3 50
A fine red Pipe with Stem, Sioux, express, paid	2 50
Five fine "Bad Lands" Fossils, express paid	1 50
A beautifully exqusite set of pepper and salt shakes of Aluminum, satin finish and polished	1 00
An elegant fancy top back comb, (top 2½ in. wide) of Aluminum, never tarnish, always bright, better than silver, postpaid	50

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Alta Mira, Estado de Tamaulipas, Mexico.

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36 of these Famous Gems postpaid for only 72c. Every purchase of this popular collection will be presented with a handsome glass tube containing 10 Microscopic Crystals, absolutely perfect, and so very small, that it takes 11,000 to weigh one ounce. This collection will surely please you. Your money will be cheerfully refunded if not satisfactory. Order to-day.

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Natural Science News.

VOL. I ALBION, N. Y., FEB. 16, 1895. No. 3

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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BOTANY.

A Brief History of the Subject.

In the study of Botany one of the first questions is: What is Botany? It is the science of the vegetable kingdom, and includes a knowledge of the forms, organs, structure, growth and uses of plants, together with their history and classification. I have endeavored in as few words as possible to give a definition of Botany and its uses, and will now proceed to give a brief history of the subject. We will go back to the year 371 B. C. when Theophrastus was born, who is claimed to have been the first botanist, he having written a history of plants in which he described five hundred species. Aristotle, the greatest naturalist of antiquity, also, was familiar with the laws of plant life.

If we take up the Bible we find in Genesis 1: 11-14:

"And God said, let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth; and it was so.

"And the earth brought forth grass, and herb yielding seed after his kind, and the trees yielding fruit, whose seed was in itself, after his kind, and God saw it was good.

"And the evening and the morning were the third day."

Right here we may properly say that with the third day of creation Botany begun, and all through the Bible we find plants mentioned.

About 23 A. D. Pliny the great Roman naturalist was born, and during his life, gave an account of all the trees, shrubs and plants then known.

In the year 1707, Carl Linne, or Linneaus, the "Father of Botany" was born at Rashult, Sweden. The Linne family were all passionately fond of Botany, and were said to have taken their name from a great linden tree, which grew in the village. It is said that at college he was not very diligent in such studies as Grammar, Theology and Latin: but would rather ramble through the country lanes, so that by his classmates, he was finally called the "Little Botanist." But we find, in the end, that he became a Professor of Botany in the college at Upsala, Sweden. He was but twenty-three years old when he originated what is known as the Linnean or artificial system of analysis, which is founded solely on characters relating to the organs of fructification, leaving all other natural affinities out of view. This system of analysis, although incomplete, was the fore-runner of what is known as the Natural System, which had, for its principal author, a French savant, Laurent de Jussieu. This system of classification, takes for its basis, all those natural affinities and resemblances of plants, whereby Nature, herself, has distinguished them into groups and families. Hence, each member of any natural group resembles the other members: and a fair description of one will serve to a certain extent, for all the rest.

In 1749, Johann Goethe, Germany's greatest poet, was born, and we learn that he was the first to discover the law of metamorphoses in plants. By this is meant that the stamens, pistils, corollas, bracts, and so forth, various parts of every plant, are simply modified leaves. From this time on, there have been many prominent botanists, and if I were to give a description of what each has done for the science, it would fill volumes.

But before closing this article, I will mention a few names of the botanists of later years.

It was John Ray of England who divided the Vegetable Kingdom into two sub-kingdoms, giving us Phænogamia or flowering plants and Cryptogamia, flowerless.

Alphonso Wood was also a prominent botanist he being the author of "Botanist and Florist" and numerous other works. Asa Gray is also author of quite a number of works on the same subject. And last but not least we have Chas. Darwin, who made Botany one of his chief studies, and has given us a great number of articles and books on Botany. As a fitting close will give Tennyson's sentiments on Botany.

"Flower in the crannied wall,
I pluck you out of the crannies;
Hold you here, root and all, in my hand,
Little flowers, but if I could understand
What you are, root and all, and all in all,
I should know what God and man is."

W. GERLACK, JR., Piqua, O.

Insect-proof Books.

In India books have to be carefully protected against insects. Often a teaspoonful or two of refined mineral naptha, or benzine collas, is poured into the crevices of the binding, and then the volume is ensconced in a closely-fitting box, to be sprayed over, after awhile, with the best kerosene oil. Another way to make a book, as far as possible, insect-proof, is to brush it over with a saturated solution of corrosive sublimate.

Puff Balls.

Much attention recently has been given to the question of poisonous mushrooms. A few are injurious; but the larger number are healthful. Still the fact that a few of the mushrooms, when poisonous at all, are extremely dangerous deters many persons from using anything but the common mushroom so well known. There is one class, however, known as "puff-balls," not one of which is poisonous. The larger ones, when cut up in slices and fried as egg-plants, are just as delicious as the common mushroom. They must be taken when entirely fresh, so that the whole of the interior is of a clear white color. In this respect they do not differ from the common mushroom, which are by no means wholesome when stale.—*Meehan's Monthly for January.*

Translated for the NATURAL SCIENCE NEWS.

Snails as Food.

CARL VOGT, IN THE *Gartenlaube.*

Snails were first used for food on the northern coast of the Mediterranean, and it is there that they are still eaten in the greatest numbers. It is strange what taste is exercised in selecting them. No one ever thinks of eating the large red, brown, or black road snails, which have no shells, but crawl about naked, though these are sometimes cooked into a shiny broth, which is popularly regarded as a remedy for wasting diseases. Snails, however, are gradually disappearing from the popular *Materia Medica.*

The farther we go to the southward the more general becomes the use of Snails with shells for food. In central Germany and down the Rhine it is only the large brown vineyard Snail which is eaten. In Fulda, especially in the neighborhood of Ulm, these are reared in vast numbers and they were formerly shipped by millions in barrels down the Danube to Vienna, there to be reshipped to more distant places.

Farther to the north Snails are regarded with as much disgust as Englishmen have for frogs, but they are eaten in large quantities all over France and in Burgundy they are prepared by a particular process which has grown popular in Switzerland. Every day in Geneva I go from my home through the city by the Caronge street, passing a number of restaurants, in the windows of which are the never failing plates of "*Escargots a la mode de Bourgogne,*" with their yellowish white, green speckled contents. In Switzerland they eat not only the vineyard Snail, which was introduced from the south, but also the *Helix aspera*, first imported by the Monks. The latter species is finer flavored than the former and is reared in large quantities in Freiburg Uechtland.

As soon as we pass the Alps we find a greater variety of Snails in the markets and the farther south we go the more and more popular they become as an article of food. They are eaten in great quantity in Naples and Palermo, and also in Barcelona and Granada. Rossmassler, the great authority on Snails, was greatly surprised on seeing the large numbers of them collected among the arid chalk hills which surround certain Spanish cities.

In the north none are eaten but those having porous opercula with which to close the apertures of their shells on going into winter quarters. The Snails are first boiled and then the bodies are withdrawn from the shells and prepared in various artistic ways. In the south such nice distinctions are disregarded, and they are eaten at all seasons, whether provided with the operculum or not. Snails are often stewed in open kettles on the streets, and a plateful can be had for a soldo. This will prove sufficient and the stranger who tastes them will never ask to be helped again. Yet when they are prepared in the Burgundian way, chopped with butter, eggs and fresh vegetables, they make a delicate and apetizing dish.

Along the coast Sea Snails of various kinds compete with those of the land. Whoever breakfasts on the coast of Bretagne, in Nantes, Concarneau, or Brest will be surprised by seeing the waitress approach with a plateful of pretty little spiral Snails, beside which lies a large pin bent into a hook. Until the more solid courses appear the guest whiles away the time by picking out and eating the Snails. Many guests become very skillful at this, yet I do not believe that they can satisfy their appetite with these little things, which by the way are delicious morsels. This singular custom is not widespread, for east of Brest, in Morlaix, Roscoff and Saint Malo, I have never seen Snails collected or eaten, although they are to be found in abundance in those places and may be seen clinging to all rocks and stones left bare by the ebb tide.

Equally whimsical tastes prevail along the northern Mediterranean regarding the *Patella*, which is very abundant there and is left high and dry at ebb tide and does not recover its animation until the water rises and covers it again. In the summer when we crossed Villafranca bay from Nizza, to spend our Sundays under the lofty olive trees of Beaulien the party would disperse, to wade about, with trousers rolled above the knees, in search of the *Patella.* These Snails clung so firmly to the rocks that the men often carried chisels to pry them loose. Still no Snails were saved for mealtime, they were all devoured, fresh like oysters. I cannot say that I enjoyed barnacles as my Nizzian acquaintances did, the nearly circular foot of solid muscles by which the animal attaches himself and which forms the principal part of the body, appeared to me to be tasteless, and hard enough to break one's teeth.

The people of Roscoff and vicinity must be of the same opinion, for they never eat barnacles, although they can secure them in large quantities. Women, children and old men follow the receding water, each carrying a sack and an iron implement, which is bent into a sharp angle, sharpened on the outer edge and supplied with a handle, for loosening the animals from the rocks. They collect the barnacles in their sacks, carry them home and feed them to the hogs and poultry, which often have no other food.

In this way the poor fowls get a vile flavor of train oil and fish, so the next year when we returned to Roscoff for a prolonged stay, we sent orders for our landlady to buy up ducks and chickens two months before our arrival and feed them on grain and clover to free them from the taste of train oil. It cannot be denied, however, that the fowls grew very fat on shell fish, though the flavor of their fat did not suit our palates. Yet there is no disputing about tastes, for Icelanders prefer rancid butter to fresh, and the people of Botz island like their train oil geese best.

Although the Bretons do not eat the barnacle until it has been digested and has assumed the shape of some warm blooded animal, they still regard the sea ears, *Haliotis*, as great delicacies. Who does not know these spoon shaped shells, broad, shallow, ear like and slightly twisted at the smaller end, whose interior shines like mother of pearl, and whose exterior is pierced by a series of holes through which the water can penetrate, even when the animal is firmly attached to the rock. The shell is as large, or larger than an outspread hand, and the whole inner surface is occupied by a huge, thick and solid foot. The foot resembles that of the barnacle although the animals are totally dissimilar.

The sea ears are only accessible at the time of the lowest tides, during the equinoxes. During ordinary low tides they are covered by several meters of water and can only be obtained by dredging, at least that is the case at Roscoff. Even during the lowest ebb none but those most familiar with the region can venture out to take the *Ormeaux.* It is very easy for the

hunters to be overtaken in the deep cavities where the shells are found and cut off from the mainland by the returning tide. Boatsmen, sailors and coast dwellers are seldom able to swim, and as a rule do not wish to learn, for they say that swimming could not save them, but would only prolong their sufferings.

The men are very proud when after a low ebb they can bring home a dozen *Ormeaux*, but the women are less elated, for the burden of preparing the food rests upon them. The animal is taken out of the shell and the whole body is removed, the foot being used. If this mass of solid muscles, rigid in death, should be cooked at once it would be no softer than shoe soles. The cook must first beat it for hours on a smooth stone with a hammer, when the pastime becomes tedious she sends the meat to the forge where the operation is completed on the anvil. It is then boiled, baked and stewed, and when it is served with soup, prepared like turtle soup, the *Ormeaux* tastes like soft caoutchouc, and is destitute of individual character.

The *Calamage* of the Italians is also like cautchouc, consisting of the arms and muscular mantles of polypi, cuttlefish, and devil fish, which are offered for sale in all the markets on the sea coast, and which are regarded as fresh as long as their skins retain the glistening, ever changing play of colors. In the hotels and restaurants of Naples one can scarcely get a plate of *frittura*, whether of fish or accacia blossoms, without a garniture of *Calamage*.

Especial value is placed upon the arms of yonng cuttlefish and octopods when they are about the length and thickness of heavy lead pencils.

These animals are captured on all coasts, even far to the north. They dash furiously upon white or bright colored rags, which are trailed back and forth on lines, clinging so firmly with the hundreds of suckers on their arms that they can be drawn out before they can let go. A stab with a knife through the joint back of the eyes only half kills the animal, but it is sufficient to enable the captor to cut its intestines out of the sack in the mantle. The edible parts, mantle and arms, are thrown into boiling water to loosen the skin, and then the flesh is boiled in oil with fish or the other ingredients of the *frittura*.

Caoutchouc, as I have said, is rather tough, an excellent substance for testing the sharpness of the teeth. It has no taste of its own, none but that which the seasoning gives, yet I have known people who "adored" *Calamage* and preferred it to the finest fish. I have noticed that the connoisseurs were all young people with strong teeth and sound digestions.

ANGUS GAINES.

Fishes Killed by Falling Up From the "Bottom of the Sea."

The third monthly meeting of the Society of Natural Sciences was held Tuesday evening at Good Will hall. Professor H. W. Conn, of Wesleyan University, delivered an interesting lecture on the "Bottom of the Sea."

Professor Conn had a large number of instructive views of apparatus used in sounding and dredging, as well as photographs of many of the unspeakable creatures that the dredge has brought up. There is no sensible amount of light at a greater depth than 300 or 400 feet, the most sensitive photographic plates being unaffected even by very prolonged exposure. The fishes are therefore obliged to hunt their food by the aid of dark lanterns, as Professor Conn expressed it; in other words, they are phosphorescent, and see by the aid of the light that they themselves emit.

One of the great difficulties of deep sea exploration is that it takes about all day to throw out one dredge and haul it up again, even although the line is worked by steam power. The dredges used until recently had a habit of becoming tangled with the sound rope, and frequently when the day was over it was found that the dredge had become entangled immediately upon being thrown overboard, so that the day was entirely wasted. The great pressure at the bottom of the sea (from three to six tons on a square inch) will crush glass to a fine powder, so that it has been difficult to obtain good measures of the temperature in the deeper parts. The professor described an ingenious thermo-electric apparatus by means of which this difficulty had been overcome.

The greater part of the bottom of the ocean consists of red mud and of globigerina ooze, the dead shells of a minute foraminferous creature, so abundant that its shells make up a big part of the ocean floor. There is no life below three miles. In speaking of some of the fishes that inhabit the lower depths, the professor said that they often "fall upward" to the surface and are killed by the reduction of pressure. The air in their swimming bladders, he explained, is compressed by the pressure of the ocean into very small space. When the fish is so unwise as to leave his native haunts to explore regions half a mile or so above him, the diminution in pressure causes the air to expand, and the fish becomes so buoyant that he cannot swim back again, and the further he rises the worse his plight becomes; and after a time he reaches the surface, by which time the the expansion of the air has become so great that the fish is often literally blow to pieces, and is found floating about in this condition.

The professor said that in the lower depths of the sea the quiet is so profound that in comparison with it the most barren deserts on the surface of the earth are scenes of the greatest activity; for on the desert there are variations in wind and in temperature, and alternations of day and night, while in the great depths of the ocean there is no life, there are no currents, the temperature is uniformly 33 degrees year in and year out, and night reigns perpetually. The surface of the ocean is the poet's favorite metaphor for unrest, but there is nothing so quiet and changeless as its profoundest depths.—*Hartford Times.*

We have heard it said that the man who hunts up the taxes should be called "Taxidermist," because he skins everybody.—Ex.

Collection of the Ohio Archæological and Historical Society

The collection belonging to the State Archæological Society has recently been removed from the State House to the new fireproof museum of the State University. For many years the collection has remained in the State House. It was sent to the World's Columbian Exposition, and it also was exhibited at the Centennial Expositon of the Ohio Valley. From year to year donations and exchanges have increased it, and today it stands as one of the foremost Archæological exhibits in the

entire State. It has been catalogued and rearranged, and now presents a more attractive appearance than it did in the dingy corners of of the State House. It consists of 7,560 specimens, and fills eight large combination table-wall cases.

The collection is largely the result of the efforts of several well-known collectors. Mr. Harness Renick, of Circleville, was interested in Archæology for twenty years, and shortly after the Ohio Exposition he presented the Society with his cabinet. As his collection was very large, the bulk of the Society's exhibit comes from Pickaway and Ross Counties. Considering the superior workmanship exhibited in the Scioto Valley relics, it is not surprising to find that Mr. Renick's collection is considerably above the average in fine slate ornaments and ceremonials.

While the exhibit is largely Archæological, there are a great many papers and relics of historical value. Chief among these are some iron and steel tomahawks, copper kettles, silver earrings and brooches from the Shawnee and Delaware village sites of the State. There is a valuable wooden dipper, a powder horn, and a bread sack presented by one of the head chiefs of the Shawnees to settlers in the Pickaway Plains.

The exhibit from Flint Ridge covers all the known forms of implements from raw material down so the finished arrowhead or drill. Many of the Flint Ridge specimens are of exceedingly bright color, and some of them are very large.

There are several thousand arrow and spear-heads in the exhibit arranged mostly according to form. These are of various sizes up to eight or nine inches in length. Many of them have round, smooth tops, so highly prized by the collectors. The collection is deficient in perforating and drilling implements, but on the other hand excels in the serrated and rotary spear-heads and knives. It contains more than four hundred and fifty celts, axes and pestles. The axes are nearly all of the type having a groove extending three-quarters of the way around. In the lower Scioto Valley it seems that but few of the flat axes are found; those slightly hollowed on the back are more common. In such parts of the collection as come from the eastern and northern portions of the State, the flat backed axe is very rare.

The celts are of a rather common form, though some of them are highly polished. There are a few of them flat on one side and oval on the other, having that slightly curved or bevelled edge so rarely seen in collections. As a rule, they are large and thick. Many of them weigh two or three pounds and, are from four by seven to three by eight inches. There are a number of small celts, but they are of the same general type as the large ones.

Quite a number of the long roller-like pestles are in the collection also some very fine bell-shaped ones. Others have a ring or projecting edge at the top, are gracefully narrowed towards the center, and made broad and flat at the grinding base. The hammers are both single and double grooved, and for the most part are sandstone and granite. I think that the lower Scioto furnishes more sandstone axes, celts. pestles and hammers than any other section of the Ohio Valley.

The pitted hammer-stones and large sandstone slabs having cup-shaped depressions on either side, are quite numerous in the collection. As Mr. Fowke well says, these singular pitted stones have never been satisfactoriiy explained. One of the specimens has twenty-two depressions on its two sides.

Very few institutions in this country possess a complete set of casts of Squire and Davis' famous effigy pipes. The Historical Society has the entire hundred and fifty. They are colored to represent the originals and serve the student well. There are also reproductions of some of the more famous small objects of the Mexican Museum, and also Peruvian and Central American pottery.

There are something over a hundred and forty ornaments, ceremonials and pendants, and about twenty pipes, discoidals and hematites. One of these pipes is ten inches in length, and shaped like the long, slender ones found in the south. It is made of steatite, and closely represents the Iroquois, rather than an Ohio type. The ornaments are largely of slate and shale, although one or two are granite. All the forms, common and rare, are represented. The flat tablet-like ornament with two perforations predominates. There are twenty or thirty ornaments having one perforation at the upper edge. There are two or three stones exhibiting rude pictographs, and one with hieroglyphs, which is doubtless a fraud.

By means of exchanges the Society has become possessed of a number of Eskimo bone implements and carvings, and also a small but valuable collection of California mortars, pottery and other Pacific coast specimens. It contains several dozen specimens of Missouri pottery, and also an exhibit of southern quartz and argillite implements. The tops of the cases are covered with Zuni and Moqui pottery, war clubs, etc. There is a large crayon portrait of Sitting Bull, which was taken two or three months before the Messiah craze originated. This is the cnly crayon made from life during the latter years of Sitting Bull's career, and is considered very valuable.

As the bulk of the material comes from one locality, its careful study will give one an insight into the life of the tribes of the region. As there are other large collections in the same museum from different parts of the country, the opportunities for study and comparison are excellent. To briefly sum up the general results of an inspection of the Historical Society's collection, one would arrive at the following conclusions: That Flint Ridge stone furnished the bulk of the arrow-heads and spears, knives, etc., but that some local materials were employed. That sandstone was used more than granite, slate or other stones. That long pestles are more numerous than in other parts of the State. That the celts are nearly of one type, rather large and thick. That axes are mostly "flat backed." That pottery is thick, generally plain and of poor clays. That fine work in ornamental, ceremonial and emblematic stones, pipes, etc., is more common than in other sections. That foreign materials found on the village sites indicate considerable aboriginal trade and exchange.

The conclusions might be carried further, but this would trespass upon the testimony of the mounds of the region, and it is here desired to consider only the surface material. Suffice it to say, whether a student confined his conclusions to the results of village site and surface searching or to the excavation of mounds, his cenclusions would be the same, that the people who inhabited the one built the other.—*The Archæologist.*

[Prof. Warren K. Moorehead is the curator of this collection.—Ed.]

Kind Words for the OOLOGIST and NATURAL SCIENCE NEWS.

NATURAL SCIENCE NEWS, No. 1, reached me today, and I am highly pleased with its neat appearance, and interesting matter. Wishing you success in your latest venture, I am, yours, D. E. Danby, Custer City, So. Dak.

THE NATURAL SCIENCE NEWS promises well. It has prompted me to make two orders for specialties advertised in it. Dr. Wm Blackburn, East Pierre, So. Dak.

First number of NATURAL SCIENCE NEWS received today, and we are much pleased with it. H. H. & C. S. Brimley, Raleigh, N. C.

Vol. I, No 1 of your NATURAL SCIENCE NEWS just received. I am well pleased with it It is something I long have felt the need of, and I said when I heard of your undertaking; "It is bound to be a grand success with Lattin behind it." I believe it to be the right paper by the right man, and it should receive the hearty support of all who are interested in any of its branches. J. Merton Swain, East Wilton, Me.

I am well pleased with both paper and premium; in fact better than I expected. I wish the NEWS good luck and plenty of it. Walter G. Savage, Hillsboro, Iowa.

I am convinced that the OOLOGIST is the best paper on "Oology" and "Ornithology," that I know of. It is instructive, and is a fine medium for exchange notices. Will soon favor you with my subscription to the NEWS.—A. P. Simmons, Troy, N. Y.

I well appreciate your ability in the field of Natural Science, and cannot help but patronize you, although I am only a beginner, in the study of Natural History. With the aid of such good papers as we have now on the branch of Natural Science, I think every lover of nature is within the reach of the necessary education. In this line, your publications stand foremost, and we cannot thank you enough for it. The publication of the NATURAL SCIENCE NEWS is a marked example of all this.and I think is another step to the front. Wishing you the best of success, I am, Yours, Paul L. Schaefer, Addison, Ill.

I think the OOLOGIST the newsiest ornithological paper in America, and one of the best advertising mediums aiso. Wishing you and your enterprise unbounded success, I remain, Yours, John Beckwith, Spring Hill, Tenn

Please send two or three blanks to fill out. I think I can get you that many subscribers to the NATURAL SCIENCE NEWS. that will send about the first of Februray, as that is pay day.—Wm. Sayers, Windom, W. Va.

I enclose a dollar for subscription to the NATURAL SCIENCE NEWS, and hope your venture will prove a big success. A weekly will be something new in the field of natural history literature, and I think it will be appreciated.—George Pine, Gulf Key, Fla

Your favor was received some days ago, but I was unable to attend to the matter sooner, on account of the weather. Although money is very hard to obtain just no , I could not resist the opportunity of taking advantage of your very generous offer. Enclosed find the dollar for the NATURAL SCIENCE NEWS —Harry W. Carriger, Sonoma,Calif.

Enclosed you will find the $1 for the NATURAL SCIENCE NEWS, and if it is anything like the OÖLOGIST it is "dirt cheap." There is no magazine, periodical, paper, etc., etc., that has given me so much pleasure and satisfaction as the OÖLOGIST; therefore I hail the coming of the NEWS with particular joy, knowing that you have treats in store for us. Surely all the subscribers to the OÖLOGIST ought to be subscribers to the NEWS. Wishing you great success in your new undertaking, I remain, yours, Alex. H. Noel, (Principal of La Clede School) St Louis, Mo.

If I can do anything to help along the NATURAL SCIENCE NEWS I shall be pleased to do so.—Mac Wilkinson, Washington, Ont., Canada.

As I was one of he pioneer subscribers to the OÖLOGIST, I presume it will only be proper that I be among the first of the NATURAL SCIENCE NEWS. I am interested in Lepidoptera, and N A. Ornithology and subscribe for upwards of 50 papers devoted to these subjects, but I assure you that the OOLOGIST is as welcome as any of the others. May the NEWS be just as welcome.—Levi W. Mengel, Reading, Pa.

I think it is a paper every collector and dealer should have. H. Myers, Brooklyn, N. Y.

I wish you a hearty success and may your subscriptions reach into the thousands. H. W. Boers, Detroit, Mich.

I hope this new venture will not be the cause of lowering the high standard of the OÖLOGIST. Alex. H. Phillips, Princeton, N. J.

I hope its bright pages will continue for many years, and that I shall live to enjoy them. Jerome Trombly, Petersburg, Mich.

I think NATURAL SCIENCE NEWS will be the paper. R. C. Cogswell, Lawrence, Kans.

To show you how I appreciate your offer I enclose U. S. Express Order for $1 for one year's subscription to the NATURAL SCIENCE NEWS, and please send me the first number. Allen J. Reynolds, Connorsville, Ind.

I assure you I am glad to be counted as an advance subscriber (as I was to the YOUNG OÖLOGIST). I assure you that I shall look forward with great interest for the inital number, and rather than be deprived of it I will trust to luck and enclose the dollar. Wishing you the best of success in your new venture, I am as ever, Yours, R. D. Goss, New Sharon, Iowa.

Enclosed find 50 cts. for which you may renew my subscription to the OÖLOGIST for '95. To any lover of Nature and especially to those who love bir s. their nests and eggs, the OÖLOGIST is invaluable. Wishing you the success in the future that you have had in the past, I remain —W. Leon Hart, Canton, Ohio.

I am gratified to find that someone has the enterprise to start a Collector's weekly. The large number of practically useless "monthly" papers which spring up, for a short period and then perish, is not only disgusting, but a discredit to our science. I take pleasure then, in sending you my subscription. Wishing you every success with the new enterprise, I remain yours,—C. C. Purdum, Baltimore, Md.

I enclose order for $1 50 to renew my subscription to the OOLOGIST and to pay one year's subscription to NATURAL SCIENCE NEWS.—John Williams, Coralville, Ia.

Relative to the NATURAL SCIENCE NEWS, I hope you will have perfect success with it in the future, and I am sure you will.—C. R Stockard, Columbus, Miss.

Mr. Lattin, if the NATURAL SCIENCE NEWS is as good as the OOLOGIST, it will be all right.—J. W. Sugden, Salt Lake City, Utah.

I enclose one dollar for the NATURAL SCIENCE NEWS, commencing with the first number.—Geo. C. Futroye, St. Paul, Minn.

I have been a subscriber to the OOLOGIST for the past eight or nine years, and during that time have seen dozens of competitors arise, but they have all died young, and the OOLOGIST has been almost the only "stayer." And with the illustrations promised, it will undoubtedly hold its own. I at least, would not be without it.—Don Currie, Minneapolis, Minn.

Being so well pleased with the OOLOGIST, and believing that the NATURAL SCIENCE NEWS will be as pleasing, I cannot help but send you the dollar for its subscription. —Antonin Jay, Los Angeles, Cal.

I think that your paper will be satisfactory, and will be one of the best publications devoted to natural history. As an amateur, I am getting interested in various branches of natural science, therefore I think I will be pleased with your journal —Geo M. Puffer, New Haven, Conn.

Please find M. O. to pay my subscription to the OÖLOGIST for the present year, '95. This is its seventh year with me, and although I am a little late, I have no intention of losing it yet. The illustrations in the January issue which came to hand this morning are very pleasing feature of your bright little paper, and shows that the OÖLOGIST is keeping up with the times.—C. R. Ball, Little Rock, Iowa

If you have as good reading matter in the NATURAL SCIENCE NEWS, as you have in the OÖLOGIST, you will have two as good papers as there are in press.—H. A. Totheroh, Reading, Pa.

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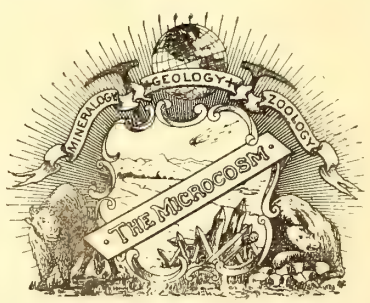

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Niagara Falls.	6:35	8:05	11:10	1:40		5:50
Susp. Bridge	6:45	8:10	11:20	1:48		5:55
Lockport	7:30	8:50	12:00	2:25		6:35
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Natural Science News.

VOL. I ALBION, N. Y., FEB. 23, 1895. No. 4

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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Is There a Sense of Direction?

BY DR. MORRIS GIBBS.

I am led to offer a few observations on what you may reasonably call the "Sense of Direction," or we may boldly adopt or resurrect that formerly much used, but now neglected word "instinct." Whether the following instance points to reasoning, instinct, as formerly acknowledged but now often disputed, or a gift, or "sense," I will not undertake to say.

In our front yard is a a burr oak, *Quercus macrocarpa* which has been sadly infested the past few seasons, by the larva of *Edema albifrons*. Thousands of caterpillars were destroyed in their earliest stages and tens of thousands of eggs were stripped from the tree during June and July, but the vast majority of caterpillars were out of reach, and continued to thrive. In late August and early September, immense numbers dropped from the limbs to the ground. Of these, many were intent on performing their transformation, and therefore anxious to leave the tree, but over two-thirds of them were of only half to three-quarters size, and required from five to fifteen days more of feeding, and probably fell from the limbs accidently. It was a very easy matter to tell if a caterpillar had reached the ripe stage for metamorphosis, by returning it to the tree trunk; when if ready for the prospective change, it immediately dropped from the bark or turned about and descended, and again sought a place where it could enter the chrysalis state. If, however, it was less than full size, it would immediately pass up the tree and out upon the first limb it came in contact with, where it proceeded to feed from the first heathy leaf. The one object of the full size caterpillar, was to get away from the tree, and they could be seen travelling in every direction from a common center. The smaller individuals, however, were only anxious to reascend the tree, and here the instinct or sense of upward direction, was not accompanied by knowledge or reason, for they swarmed up the columns of the veranda, the stone foundation and the house, and as well, up the trumpet-creeper and other plants, shrubs and trees. As might be expected, more found the trunk of the tree from which they fell, than all other uprights together, because it was much nearer, but I repeatedly saw individuals pass within a few inches of the oak tree trunk, and going on in a straight line, reach and ascend a small elm tree. There is a good sized sugar maple, *Acer saccharinum*, at sixty feet distance, and this they also ascended in numbers, and I have seen as many as twenty-eight on the trunk below the first limbs at one time. Of course the foliage of the maple and elm would in no way answer the requirements of this oak-feeder, and as a matter of course, the caterpillers, sooner or later, not finding proper food, descended to the ground again or died. In several instances I know that they dropped from the limbs of the maple and again made off for new fields, but in no case did I find an individual crawling down the trunk. This method of reaching the ground by dropping, is the one generally adopted.

The partly grown caterpillars, which were ever anxious to ascend any object, with a "sense," "instinct," or "reason" of direction, in order to secure food, were so determined "to go up," that all my efforts to the contrary could avail nothing. One which had crawled upon my sleeve, was made to turn about all of twenty times, by elevating and again lowering my hand and arm. They cannot be made to crawl down when bound to ascend. If, however, when crawling upward, a horizontal object meets their course, the caterpillars will at once leave the perpendicular and adopt the horizontal, which clearly shows that they are looking for a limb in order to reach the leaves.

It is so easy for us to admit of any animal's comprehending the distinction between ascent and descent, that many will not think the above instance at all remarkable. But when we begin to discuss plane direction, if we may use the term to simplify the meaning, we are surprised at the exhibition of "reason," "instinct" or "sense of direction," shown by this caterpillar. Yet it is fair to assert that it is as easy for the caterpillar, blind though it is, to pick out and maintain a direct line of travel on a plane, regardless of interference and obstacles, as it is to credit it with perceptions of gravitation. The caterpillar does not know east from west, but it is as equally susceptible to an influence which governs its actions, as are the migratory birds to the behests of northward and southward impulses.

Noticing that many caterpillars were moving apparently aimlessly in various directions over a cement walk in front of the house, I selected a few individuals and turned them end for end, or several times about. In a large number of instances the slowly moving creatures, would, after recovering themselves, start directly ahead and maintain the direction no matter which way they were pointing. But a number of them seemed to have an objective point for which they were aiming.

These individuals could not be made to change their courses. Placing one on a door mat, found handy for the purpose, it was spun round on the cement walk ten to twenty times, after which the caterpillar immediately headed in the diirection in which it was found travelling. There did not appear to be any reason for the chosen objective point, for it often led towards the house, and quite as often away from the tree as toward it. After whirling some of them about, right and left, they were allowed to take their courses, and each would bend around and take its original route. I do not claim that all would do this, but only a small proportion, and the per cent. is not offered. Very few of the largest sized ones would thus maintain their courses, the best in-

stances occurring with the undersized ones and which were anxious to climb the tree, as was proved.

These caterpillars were observed during rainstorms, and those which appeared to have this adherence to a particular course, were seen to maintain the routes even when it led them through little pools of water which entirely covered them for the time. Buffeted by heavy rain drops, they went on wallowing through water over tussocks of grass, in a straight course, to where? With what object? Who knows? Following a course, which in nine cases in ten led to death. What was the impulse? Why did not instinct, reason or a sense of direction guide this caterpillar to the proper tree?—KALAMAZOO, MICH.

The Chicago Academy of Sciences.

BY FRANK C. BAKER, SECRETARY.

In 1857, a society for the promotion of science, was formed in Chicago, taking the name of "The Chicago Academy of Natural Sciences." About $1,500 was subscribed, a room taken in the Saloon Building, corner of Clark and Lake Streets, a few cases were made, and a museum was begun. In 1859, the society was incorporated by the name of "The Chicago Academy of Sciences."

In the winter of 1863-4, several prominent citizens of Chicago resolved to found a Scientific Museum in the Metropolis of the Northwest. A large sum of money was accordingly subscribed, an Act of Incorporation, (1865) as now published, was obtained and the Academy was placed upon a solid foundation, Mr. Robert Kennicott was appointed first Director of the Museum. Collections rapidly rolled in and rooms were taken at the Metropolitan Building, corner of Randolph and La Salle Streets. In 1865 Mr. Kennicott, with a party of young naturalists went to Alaska to survey a route for a telegraph line, then proposed to connect North America with Russia. From this expedition Mr. Kennicott never returned. He died suddenly of heart failure, on the banks of the Yukon River. After the death of Mr. Kennicott, Dr. William Stimpson was appointed Director of the Museum.

June 7, 1866, the building in which the Museum was placed was partially destroyed by fire. The collections were much damaged, and parts were wholly destroyed. This calamity brought the question of a permanent building to head, and a lot on Wabash Avenue, north of Van Buren Street was purchased and a fire-proof building erected. The first meeting was held January 28, 1868. The building was of brick 55 ft. by 50 ft. in area, and 50 ft. high, the floors were of brick and iron, the stairways and principal doors of iron, and the windows were covered with iron shutters. The basement was used for laboratory and storeroom; the first floor for library and offices, while the whole upper part, surrounded by two wide galleries, was occupied by Museum. From this time until the great fire, the growth of the Academy, under the skillful management of Dr. Stimpson was rapid, and much valuable original work was done.

On the 9th of October, 1871, this building, in spite of the fireproof qualities which it was supposed to possess, was totally destroyed in the great conflagration which laid Chicago in ashes,—specimens, library, manuscripts, and apparatus—all that was left of the once invaluable collections, was a sheet of printed paper and a few pieces of broken pottery. Within twelve days after the fire, however, a meeting was held and steps taken towards a restoration of the Academy. A circular was issued inviting the sympathy and help of corresponding societies, which elicited many immediate and liberal responses. The loss of his priceless manuscripts so prostrated Dr. Stimpson that he died on the 26th of May, 1872.

It was soon determined to rebuild upon the old site, and upon the same plan, modified by such improvements as experience could suggest. Upon the front ot the same lot a business block of the first-class, four stories in heigth was erected. The restored building was occupied in the fall of 1873. The funds at the disposal of the Academy being insufficient for their needs, they borrowed such additional sums as were necessary, securing the lender by a mortgage upon the whole property. They estimated that the income from the property would provide a sinking fund by which the original indebtedness would be paid when it became due. The scheme, however, proved disastrous. The new building did not pay the interest on the indebtedness, and after a term of years, in process of law, the whole property was lost to the Academy.

When, in 1886, the Academy was finally driven from its home on Wabash Avenue, the Exposition Company received the collections within its building upon the lake front and paid the expense of their maintenance. But in its turn, the exposition company was ousted and its building destroyed. The property of the Academy was sent to storage, where it remained for several years. [During its early days in the old Exposition building we first made the acquaintance of the collection and our genial, whole-souled friend, Dr. J. W. Velie, who at that time was Secretary and Curator of the Academy and unselfishly placed his time, money and extensive collections at the Academy's disposal.—ED. N.S.N.]

In 1891 when the affairs of the Academy seemed to have reached their lowest ebb, a proposition was made to unite its fortunes with the University of Chicago, then just organizing. This the Academy was not willing to do, feeling that in time the identity of the organization would become lost in that of the University. In 1892 a generous citizen of Chicago, Mr. Matthew Laflin, seconded and aided by his son George K. Laflin promised to give a sum adequate for the purpose of erecting a building which should stand for all time as the home of the Academy. In addition to this, it was ascertained that it was possible for the commissioners of Lincoln Park to aid in the prosecution of such an enterprise, by offering a site and additional endowment. The result is one of the most perfect museum buildings situated in one of the most beautiful parks in the world. In June, 1893, the corner stone was laid and Nov. 1, 1894, the building was formally thrown open to the public.

The new building is a plain rectangular structure measuring 150 by 50 feet. The material of the building is Bedford stone and the architecture is Romanesque. Over the central doorway is the inscription MATTHEW LAFLIN MEMORIAL.

The interior is decorated in old gold and ivory giving a soft tone to the light. There is electricity, running water, electric bells, elevator, and all the modern improvements which go to make up a perfect museum.

The library contains 5000 scientific works. It communicates with the museum by two stairways.

The museum hall is 150x50x30 feet, with one wide gallery. Upon the main floor there are 24 large cases, in the gallery the same number with the addition of a large rail case. Unlike most museums *there is not a dark corner in the building* from cellar to garret.

The collections consist for the most part, of North American productions, and are most complete so far as the valley of the Mississippi is concerned. In Mullusca, the collection is rich in North American forms.

With a new building and the best of facilties, it is believed that the Academy will again occupy a prominent place among Scientific bodies, and regain the prestige and fulfil the promise of its earlier days. *The Nautilus.*

The Cork Tree.

Cork is the bark of a species of an oak, a native of the south of Europe and the north of Africa. The tree is usually from twenty to forty feet high, very branchy, with ovate, oblong, evergreen leaves and a thick, rough bark for which it is cultivated. Cork tree acorns are eatable and taste very much like chestnuts.

When the bark is from three to five years old it has a spongy appearance, new layers of cellular tissue being formed and the outer layers cracking from expansion until they are finally thrown off in large flakes. Usually cork that is intended for the market is stripped from the tree a year or two before it would naturally come away, In stripping off the cork incisions are made both lengthwise and across the tree to the proper depth and then peeled off by a curved knife which has two handles.

This process is repeated every six or eight years. It is only after third peeling that the first class quality of cork is obtained, the bark of young trees being useless or of very poor quality.

The removal of the cork from the tree does not mean the removal of the entire bark, but only those spongy layers that no longer have life. When the dead layers are properly cut away the health of the tree is greatly promoted and it will continue to yield crops of cork for 150 years.

Before the pieces of bark are put up in bales for the market they are soaked in water, pressed flat and then dried. When dry they are slightly charred to remove decayed parts and conceal defects.

The world's chief supply of cork comes from Spain and Portugal.

D. V. F. in *Normal Instructor.*

Tanning Large Skins for Rugs.

In addition to Dr. Morris Gibb's criticism of Mr. Davie's "Methods in the Art of Taxidermy" in December Oologist, there is one point which I should like to add, and which is equally true of all other works in this line. While I take much pleasure in mounting birds and game heads which have been taken in my own hunting trips and there would be derived equally as much pleasure in mounting pelts, such as Foxes and Bears in the shape of rugs, if I could only get the information of how to tan them correctly. It seems to me as though this was equally a part of the work and knowledge of a good Taxidermist. However all the works on Taxidermy may be searched thoroughly and there will be absolutely nothing of any value found upon this point. Hornaday tells you to have your pelts well tanned, Davie does not even tell you this. Though there are ten or twelve lines on tanning small skins, which certainly is of no value when it comes to preparing a large heavy skin.

It was with a great deal of impatience that I awaited the publication of the "Methods in the Art of Taxidermy," hoping that it would fulfill my long-felt want, but it was with great disappointment that I looked this book over, finding nothing on this subject. It seems to me a great mistake and what this work needs to make it complete is a chapter devoted to the tanning and mounting of skins in the form of rugs.

If anyone can give me any information as to where it is possible to get information on this subject I would be exceedingly grateful.

A. H. Phillips.
Princeton, N. J.

Some of Our Common Butterflies.

Probably nearly all of the readers of the Natural Science News living east of the Mississippi River, have seen the butterflies I shall speak of here, but perhaps some would like to know more about them. First, then, we will spend a few moments with the Milk-weed Butterfly, known to Science as *Danais archippus.* The colors are mostly red and black. The black running in stripes through the red and varied with a few white spots. Extent when spread out, about 4 to 5 in. The only one looking like *Danais,* is *Limenitis dissippus,* a smaller species with a black band crossing the black stripes, which *Danais* has not. This butterfly gets its name from hovering around the milk-weed on which the eggs are laid.

Of course you all know that all butterflies start as worms, how many can tell what worm will change to a certain butterfly? And, also, do you know what plant that worm feeds on? Seldom the plant that the butterfly prefers as its restaurant; for that's all their feeding place is, a sip and they go on to return at their pleasure. The Milk-weed Butterfly does feed some on the blossoms of the common milk-weed (*Ascelpias tuberosa*) on which its eggs are laid, but is more often found on the teasel (*Dipsacus sylvestris*).

They are difficult to catch on the wing as their flight is strong and swift, but, can be easily taken when feeding, though teasel heads are very destructive to a net. The eggs are deposited on the milk weed about the last of July, and hatch in a few days. The caterpillars known as larva grow about 2 weeks and then envelop themselves in a thin case known as the chrysalis. This is called the pupa stage and lasts about ten days, when, about the last of August this butterfly becomes very common. A few of them may hibernate and come out late in the spring, but, I think most of them are perpetuated by the last lot of pupæ some of which winter in sheltered situations. This butterfly flies very late in the season, in fact, I have often picked them up, in October, when they had become so thoroughly chilled over night, that they were helpless at 9 o'clock in the morning. The chrysalis is hung to any thing handy; very seldom to the plant on which the larva feeds. It is light green in color with a row of black dots on the sides, and a few gold dots on the upper end with a band of same around the lower end.

Another interesting family is that of the Swallow-tails; *Papilio* is the scientific name. We have three common species. First in order of abundance comes *Papilio asterias,* known as the Black Swallow-tail. It can be recognized by the dark color, the two rows of yellow spots

on the upper side and the long tails to the lower wings.

The female has only one row of yellow spots crossing the upper wings, the second being incomplete. They first appear in June and continue into September. The eggs are laid on parsnips, celery, carrots and like plants and the larvæ often do considerable damage to young plants. They may be known by the black bands and rows of yellow spots around them and the disagreeable odor they emit when disturbed. The butterfly is mostly found feeding on red clover or garden flowers, being very fond of the verbena. It is not a hard butterfly to take in a net and is always common here.

Next comes *Papilio troilus* or the Green-spotted Swallow-tail. It is easily know by the dark colors and the greenish color of the spots of which there is only one row on each of the upper wings in either sex. This species as a rule is larger than the last, in fact it is the largest of our butterflies, except, possibly, some specimens of the Milk-weed Butterfly. They do not appear as early as the last, usually not until July, becoming common in August. The eggs are laid on shrubby trees usually the sassafras and the larvæ spins the edges of the leaves together making a tent which it proceeds to devour, literally eating up its own home.

This butterfly is very swift on the wing and does not stop often, making them much harder to get than the last.

Our last species of this family known as *Papilio turnus*, or Yellow Swallow-tail is the most erratic of any of the butterflies I have observed. They are never very common in this vicinity, and some years, notably the past season they have been positively rare. It is entirely different from the other two, and may be easily known by the predominance of yellow on both upper and lower wings, with a black border and long tails.

Their flight is high and swift and as they stop to feed only at long intervals they are difficult to capture. The eggs are mostly laid on trees of the rose family especially Apples, Pears, Plums and Cherries, but they never get thick enough to do any material damage,

Perhaps you have all noticed my next species, the Yellow-bordered Butterfly, known as *Vannessa antiopa*. It may be easily identified by the purple-brown color bordered all around with a wide band of yellow. This butterfly has a very velvety appearance. It is sluggish and unsuspicious and may be found more or less common from May 1st to November, flying but little and spending most of its time resting on the ground, fence boards, tree-trunks, etc. In the fruit season it feeds almost exclusively on the juices of bruised or rotten fruits, prefering apples and pears. When thus engaged it may be caught between the thumb and finger and examined without hurting it materially. The eggs are laid on various trees, especially the elm.

This and other species of the family perpetuate themselves by hibernating through the winter.

Next we will look up a member of the family *Argynnis;* the Silver-spotted Butterfly known in its two forms as *Argynnis cybel* and *Argynnis aphrodite*, they are so nearly alike that only the closest scrutiny shows the distinguishing marks and their habits admit of their being treated as one. In color they are light red shading to yellow, barred and dotted with black on both surfaces, and with numerous crescents and spots of silver on the under surface of the lower wings. They are fond of feeding on the flowers of the milk-weed, teasel, and most especially the flowers of that large thistle often called bull-thistle or pasture thistle, (*Cirsium lanceolatum*). Their flight is swift but short, and they are not difficult to capture as they come back to the same spot repeatedly.

The eggs are laid on the wild violets and the larvæ pass the winter in the pupa stage.

My next two everyone has seen without doubt, as, in their season, they penetrate to the heart of our cities and swarm everywhere.

First, is *Colias philodice*, or Black-bordered Sulphur Butterfly, known to everyone by its deep yellow color, and contrasting black border. They are very common here from May to October and feed on almost any flower. The eggs are laid on plants of the *Leguminose* or pea family, mostly on the Red Clover which the larvæ make great havoc with, coming as they do, at the time when we are apt to have dry weather, retarding plant growth but favoring all insect life. This and the next bring out several broods in a season, possibly four.

Lastly I will write a few lines on the common Cabbage Butterfly, (*Pieris rapæ*). This nearly white butterfly is too well known to need any detailed description. It was introduced from Europe to Canada about 1857 and, like other foreign pests has thriven here, having spread over nearly all of temperate N. America. The eggs are laid on cabbage, turnip, and other plants of this order and the green larvæ eat rapidly proving very destructive. The two best remedies are kerosene emulsion sprayed on the plants or common ground black pepper sprinkled on the worms. Neither of these prove practicable on a large scale. While I have spoken of only 8 out of about 100, species we have, still I think it best to close before I make my subject tedious, and thereby destroy all value I could hope my article might have.

ERNEST H. SHORT,
Chili, N. Y.

A Train Stopped by Snails.

Mr. Laille, an engineer in the employ of the Tunisian Railway, writes in the *Dipeche Tunisienne:* "The train coming east from Sukel-Arba last Thursday was two hours late for a very singular reason. The road was literally covered with snails, the wheels of the locomotive crushing these mollusks into a pulp, which destroyed all adherence and caused the locomotive wheels to skate, so to speak, in their places. We have seen flocks of locusts stop trains, but I think the fact that snails can stop a train is without a precedent. These snails are very general all through Tunis especially during the rainy season; the smallest remainder of green on field or tree are covered with them, so much so that they appear like a bunch of grapes hung up, only that their white shells produce a curious effect."—*Phila. Record.*

A PECULIAR RABBIT.—Have just received a specimen for our Museum of Natural History which was sent in from the western part of the state, a note of which I thought might be of interest to the readers of the NATURAL SCIENCE NEWS.

The specimen is a *Lepus sylvaticus*, common Cotton-tail, large and healthy. The one peculiar thing about it is that its body is everywhere covered with an abnormal growth of fine silvery hair from three to four inches in length. It presents quite a shaggy appearance, resembling somewhat an Opossum in color. Can you mention similar specimens or give an explanations.—T. G. PEARSON, Guilford College, N. C.

Kind Words for the OOLOGIST and NATURAL SCIENCE NEWS.

NATURAL SCIENCE NEWS received. It is a treasure for every Naturalist. It's just like Lattin! Cordial thanks, and best success. Paul L Shaefer, Addison, Ill.

The NATURAL SCIENCE NEWS is a fine little paper, and I hope I can give you a few notes for it. Arthur Hampshire, Granville, Ohio.

I received No. 1, Vol. 1, of the NATURAL SCIENCE NEWS, and was much pleased with it. Fred W. Lyon, Glenwood, Iowa.

I received No. 2 of the NATURAL SCIENCE NEWS today, and I like it first rate. Leroy Nason, Somersworth, N. H.

You will excuse delay in sending subscription, but you may always depend on me as I enjoy the OÖLOGIST very much. Much more than some other Magazines of the same nature and of greater pretensions. T. G. Motter, Chicago, Ill.

Enclosed find Money Order for 50 cents, for which please renew my subscription to the OÖLOGIST. I have been a subscriber to the "OÖLOGIST" for several years, and shall continue one, as long as it is published. Perry D. Getty, Bloomington, Ill.

I have received the copies of the NATURAL SCIENCE NEWS, and was very much pleased with the same. No collector can afford to be without it, and I am sure that the NEWS will soon be at the top of scientific publications. Victor F. Muehler, Brooklyn, N. Y.

On receiving your favor of Jan. 11, I did not deliberate for a moment, and should have immediately sent my subscription, but for pressing circumstances of which I am now relieved. I am much obliged to you for choosing me as one of your advance subscribers for the NATURAL SCIENCE NEWS, for which please find the requsite amount. I never regret subscribing for the OÖLOGIST, for it has been of very great help to me, and I anticipate it much more than my other Magazines. Gilbert J. Symons, Utica, N. Y.

I have received two issues of the NATURAL SCIENCE NEWS, and enjoyed them. The quality of the paper and print is very fine indeed, considering the price, and especially for a weekly. M. T. Cleckly, Philadelphia, Pa.

The first copy of the NATURAL SCIENCE NEWS came to hand to day. It is just what we want—a weekly exchange medium. With congratulations. I am Yours. John W. Daniel, Jr., Bethel Academy, Va.

I have decided to subcribe for the NATURAL SCIENCE NEWS, and enclosed subscription herewith, I am very well satisfied with my investment. A. P. Simmons, Troy, N. Y.

Have just received the first number of the NATURAL SCIENCE NEWS, and an gratified with its neat appearance, and its interesting contents. Wishing you unbounded success in your new venture, I remain, Yours "Naturally," Geo. Remsburg, Atchison, Kansas.

The initial number of the NATURAL SCIENCE NEWS received, and carefully examined. I am greatly pleased with it, for it will fill a long felt need. Wishing you succuss in this and other ventures. I am, Yours "Faithfully" Guy J. Koons, Isabel, Ill.

Enclosed find Money Order, for which please renew my subscription to the OÖLOGIST, which expires sometime in the coming spring. Also send me a copy of the NATURAL SCIENCE NEWS. I must congratulate you on the contents. and general excellence of the OÖLOGIST, during the past year. I consider it one of the most interesting and valuable Magazines of its class, to which I suscribe. Wishing you continued success with this your new venture, I am, Yours Very Truly, Francis R. Cope, Jr., Germantown, Pa,

1 have received No. 2 of the NATURAL SCIENCE NEWS, and am highly pleased with it. Did you send No. 1? If not, I would be pleased to have it, for I can not afford to miss a single No. The last No. of the OOLOGIST is excellent. Some of the portraits are as fine as I ever saw. I question whether one will not discount the photograph from which it was taken. E. E, Brewster, Iron Mountain, Mich.

I have received No. 1 and 2 of the NATURAL SCIENCE News, and am very much pleased with it Wishing you success, I am Truly Yours, A. W. Thompson, Preston, Minn.

I received the first copy of the NATURAL SCIENCE NEWS and am highly pleased. Charles R. Pettis, Ellenville, Miss.

I enclose a dollar for subscription to NATURAL SCIENCE NEWS Sample copy received, and I am quite pleased with a bright little paper which will have little need of a "Naturalist's Directory," if its pages are so fully patronized. With best wishes for success, I am Yours, Howard L. Woods, Brooklyn, N. Y.

Partly because of a fraternal feeling, I send in my subscription. I remember the OOLOGIST well, and it was one of my most valued exchanges when I published the "late lamented '*Canadian Science Monthly*'" in Nova Scotia, some years since. Indeed I believe I have a volume or two bound among the remnants of my library. Wishing you every success, I am Yours, &c., A. J. Pineo, Victoria, B. C., Canada.

Have just received the first No. of the NATURAL SCIENCE NEWS and it comes fully up to my expectations. J. W. Saunders, Evans Mills, N. Y.

I have received the first No. of the NATURAL SCIENCE NEWS, and it is just the thing that all naturalists need and want, and if at any time I can be of any service to you, I hope you will feel at liberty to call on me. Hoping you success, I remain sincerely yours, Lee Roy J. Tappan, Newark Valley, N. Y.

The NATURAL SCIENCE NEWS received. Just what I have been wanting for a long time. Am glad you are succeeding so well, and I wish you abundant success. N. W. Fain, Asheville, N. C.

I wish to congratulate you in the success of the first issue of the NATURAL SCIENCE NEWS. It is just the paper that Taxidermists. Collectors and Naturalists of all classes need, bringing their Advertisements before the public ev-week, and doing away with the long space of anxious waiting where a monthly is used as a medium. The OÖLOGIST is the best "Ad." medium I have ever tried yet, and I think that the success of the "NEWS," will be still greater. It should receive the hearty and whole souled support of every Naturalist, Taxidermist and Scientist in the United States, and distant Countries. Under your able management it cannot help but be a great success. R. C. Alexander, Plymouth, Mich.

ANNOUNCEMENT.

I desire my friends and patrons to bear in mind that in the future I intend to devote my time and energy to the publishing business and the few spare moments that may accumulate will be expended in the study of the Natural Sciences.

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Faithfully, FRANK H. LATTIN.

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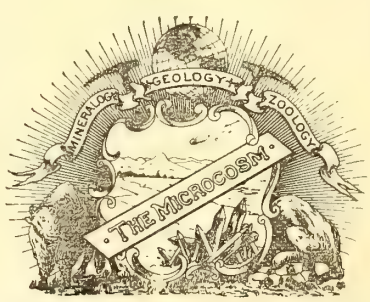

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VOL. I. No. 5. ALBION, N. Y., MARCH 2, 1895. Weekly, $1.00 a Year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO EXCHANGE.—Birds' skins from this locality for eggs in sets with data or Indian relics. Send your list and receive mine. RILEY P. BROWN, Milton, Wis.

FOR EXCHANGE.—Florida shells, sea curios, mounted fishes, live and stuffed alligators, &c., to exchange for eggs in sets and fine singles. KIRKE B. MATHES, St. Augustine, Florida.

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WANTED.—Eggs of Ostrich, Emeu, Alligator and sets with data of No's 51a, 119, 120a, 125, 126, 172, 194, 197, 202, 203, 294a, 300, 429. Will pay cash or give good exchange. WM. H. BELL, West Point, Virginia.

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WANTED.—To exchange first-class eggs in sets the coming season for singles and especially large specimens and sets not in my collection. M. T CLECKLEY, 457 Greene Street, Augusta, Ga. 4w2

FOR SALE OR EXCHANGE.—Bird skins, eggs, and minerals. Some select skins of mammals on hand: Fox Squirrels, Gray and Red Fox, Mink, Weasel, Lynx. Address, DR. W. F. HUTCHINSON, Naturalist and Collector, Box 77, Winchester, Va.

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EXCHANGE.—As I am now in Europe I will be glad to exchange French and Swiss stamps for Confederate or old U. S. stamps. H. DAVIS ACKERLY, 2 Ave. de la Gare, Lausanne, Switzerland.

TO EXCHANGE.—Venus Flytraps, *Pogonias*, also a few common singles and Hawks' eggs next summer, for singles not in my collection. BERTON A. GARRETT, Ballston Spa, N. Y.

WANTED. Confederate notes, fractional currency and Columbian stamps (above 3cts) for which I will exchange fine Mexican opals. WILL D. WALTMAN, 209 N. Wahsatch Ave., Colorado Springs, Colo.

FOR SALE.—One Great Horned Owl taken from nest last spring, tame and in good condition, one Spotted Owl, tame and in fair condition. C. B. PAYNE, Taxidermist, Cassadaga, N. Y.

BALD EAGLE.—I have for sale a few very fine sets of eggs of this species with unusually complete data. WM. H. BELL, West Point, Virginia.

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WANTED.—A collector of birds' eggs to be in partnership with me. Also want a collector for 1895. FRED JOHNSON, Box 253, Portage, Wis.

TO EXCHANGE.—One pair of fine pet game fowls for $3 worth of birds' eggs. I have 100 Columbian stamps to exchange, also. Write F. C. NEWCOMER, West Mentor, Ohio.

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TO EXCHANGE.—591b, 388, 510, 705, 563, 387, 412, 616, 619, 687, 488, 598. JOHN G. RIEXINGER, Holley, Orleans Co., N, Y.

WANTED.—A good watch, first class bird skins, eggs in sets or singles. Have in exchange a good violin, cost me $15. E. L. HALEY, Phillips, Maine.

WANTED.—To exchange birds eggs with collectors not in this state. Send list and receive mine. Correspondence solicited. MORRIS RICE, Kinloch, Mo.

WANTED.—Observations relative to Ornithology and Oology for advancement of the cause. My experience gladly given in return, J. S. BURGIN, Blacksburg, S. C.

NOTICE.—Those desiring to purchase or exchange for Tennessee eggs in sets the coming season, should send stamp for my list. A. N. ESTES, La Vergne, Tenn.

TO EXCHANGE.—Five years of Harper's Young People, beginning 1886, for best offer of eggs in sets with data or books on Ornithology or Oology or Taxidermy. HERB. B. HASKELL, Decorah, Ia.

FOR twelve dollars a fifty dollar Hart Bicycle bought from Pope Manufacturing Co., good condition. C. WHEATON VAUGHN, 47 West 83d St., New York City.

WANTED.—A second-hand copy of Coues' Key or Ridgeway's Manual. Will pay cash for either book. State price and condition in first letter. D. E. DANBY, Custer City, So. Dak.

TO EXCHANGE.—I would like to exchange eggs of this locality for others. Send your list and receive mine. C. W. PRIER, Appleton City Mo.

COUES' KEY.—A second-hand copy in good condition for $5.75 cash. If wanted by mail, 34 cts must be added to pay postage. GEORGE E. BROWN, Hyde Park, Mass.

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PARTIES wanting Florida eggs in sets with data this season at ⅓ catalogue rates, would do well to communicate with BRYAN M. GRANT, Tallahassee, Fla.

TO EXCHANGE.—A pair of climbers and flobert rifle, and also a lot of old U. S. and foreign coins for best offer in first-class birds' eggs. THOMAS V. CRONIN, Westtown, Chester Co., Pa.

WANTED.—Old coins. All those having old coins write to me and get my prices before selling them to any others. Either cash or exchange. J. S. NOAH. East Liverpool, East End, Ohio.

TO EXCHANGE.—A Kombi Camera for specimens of any kind, scientific books, or taxidermist's instruments. All letters answered. THOS. HORNE, Dover St., Milwaukee, Wis.

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(*Continued on 7th page.*)

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When answering advertisements always mention the NATURAL SCIENCE NEWS.

Natural Science News.

VOL. I ALBION, N. Y., MARCH 2, 1895. No. 5

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

In Nature's Haunt.

Written for the NATURAL SCIENCE NEWS.

I love to wander in the shade,
And revel 'mid some sylvan scene,
Where Nature wears a face serene,
And Flora's gifts are all arrayed.

Where twining tendril interweaves,
Where tiny bud unfolds its wings,
Where woodland's sweetest songster sings
On stately bough 'neath verdant leaves.

Where gentle breezes linger 'round,
And waft sweet odors from the flowers;
Where noontide sun peeps through the bowers,
And kisses earth with beauty crowned.

I love to sit beside the brook,
And watch its crystal waters leap
O'er mossy stone and rugged steep,
From sunny pool to shady nook.

I love to stroll along the brink
And gather pretty stones and shells,
Or pluck the dainty golden bells,
Whose rootlets from the fountains drink.

My very heart is sweetly thrilled
With solitary happiness,
To think that I can have access
To Nature's haunts with beauty filled.

Yes, Nature holds within her bounds
So many things that charm the soul,
No wouder that the Indian's goal
Was in the happy hunting grounds.

Though others look beyond the skies
For future happiness and bliss,
I think I am content with this,—
Sweet Nature's radiant Paradise.

GEORGE J. REMSBURG.

The Ohio State University has added to its museum one of the finest skeletons of a mastodon in existence.

A Pioneer Naturalist.

Charles Waterton may with propriety be called the Pioneer Naturalist of America, for at a time when the study of natural history was not popular and fashionable, as it is now, he spent ten years wandering among the forests of South America to learn all he could of the habits of birds and beasts. Multitudes of learned and enthusiastic students have since followed in his footsteps and added much to our knowledge of nature, but none have surpassed him in devotion to science, keen appreciation of the beauties to be found in common things, or in the powers of description.

Many of his discoveries that were strange and wonderful then are matters of common knowledge now, and questions that were in doubt and uncertainty in his time are now fully settled. You can find books on natural history that will give you fuller information than his "Wanderings," or his "Essays" contain, but his charming descriptions of natural scenery and his fascinating portrayal of the habits of all the living things that crossed his path are unequalled. More than that you find in him the great master, the original of whom most of our later essayists are copyists and imitators.

Waterton, when a boy, attended a school taught by a Catholic priest, and completed his education at a Jesuit college, where he showed great talents for composing Latin verses and developed a fondness for Latin authors, especially Virgil, which never forsook him. His writings abound in Latin quotations which are very appropriate but at the same time are very trying to the reader who is not a classical scholar. These quotations were not the outgrowth of pedantry or a wish to display his learning, for he had read the classics so much that they formed a large part of his education and of his thoughts and his allusions to them were natural and unaffected.

He had travelled upon the European continent and had witnessed the frightful devastations of the pestilence and earthquake at Malaga in Spain, and had returned to England when, in 1804, an opportunity was found for him to visit Demerara, in South America, where one of his uncles had estates. There he was so impressed with the grandeur and beauty of the primeval forests that he began an extended investigation of their wonders. The solitudes of the woods had great charms for him, and he delighted to ramble in a country where, as the lines he often quoted say,

"You are as free as when God first made man,
Ere the vile laws of servitude began,
And wild in woods the noble savage ran."

He says that the dangers of travelling through a wild and almost unexplored country are greatly exaggerated and mostly exist in the fancies of imaginative people.

The young man who dines late, drinks excessively and then goes reeling to the theater "is exposed to more certain ruin, sickness and decay than he who wanders a whole year in the wilds of Demerara." This is, no doubt true, yet it must not be supposed that the naturalist shunned danger and had no exciting adventures, for he was absolutely fearless and dared everything in the pursuit of knowledge.

On one occasion he wished to obtain a cayman, or South American alligator, for dissection, with the skin whole and the scales uninjured. Having procured of an Indian a curious wooden hook having four barbs, he at length succeeded in hooking an alligator ten and a half feet long.

His negro and Indian assistants at first refused to aid him in drawing out the creature, and insisted on killing the "game" at once, but at length, by entreaties and threats he induced them to haul in the rope, while he stood at the water's edge between them and danger. Playing the reptile as an angler "plays" with a big fish, they finally landed him. Waterton had stood prepared to thrust the mast of a boat down the alligator's throat, but when it was drawn ashore he saw an opportunity to do better still and leaped astride of it. Seizing the animal's fore legs he drew them forcibly upon its back and clung on to them as to a bridle. Now the alligator, as a rule, is not a very docile saddle horse, and this one proved no exception, but writhed, twisted, plunged and lashed about furiously with its terrible tail. Still the na-

turalist held on, and being near its head was out of reach ot its tail.

His savage allies, themselves out of danger, were delighted with his performance and shouted and yelled with exulation, paying no heed to his orders for them to draw him and his steed farther up the bank that he might be out of danger of being carried out into the stream. When at length they did understand and drew him some forty yards farther up the bank, the alligator had become quiet from exhaustion and he succeeded in tying up its jaws and securing its forefeet. He then threw himself upon its tail to keep it from doing damage with that, and after another severe struggle overpowered it completely. Placing it in the canoe they conveyed it to their camp and hung it up, and the victorious naturalist, after cutting its throat, calmly ate his breakfast and proceeded with the work of dissection.

One of the most important subjects which Waterton studied in the forest was the composition of "Wourali," the deadly poison with which the Indians tip their arrows, to make the wounds they inflict fatal. He found the ingredients to be the fangs of certain venomous snakes, two species of venomous ants, whose bites will cause a fever, Indian pepper, and various other plants, especially the terrible wourali vine. These various ingredients were placed together in a pot and boiled over a slow fire until they formed a thick syrup of a deep brown color. It was then poured off into a gourd or a calabash, a little pot of Indian manufacture, carefully covered and kept in the dryest part of the hut. In wet weather they would occasionally suspend the vessel over a fire to drive out the moisture, for the poison is the savages' most valued possession, and dampness would soon destroy its strength.

Waterton thinks it probable that it is not necessary to have all the ingredients used to make the poison effectual, but supposes that some of them may be added merely from fancy or from habit, or that superstitions, that dominates alike savage and civilized man may have much to do with the method of mixing the potent drugs.

When hunting large game the Indians used ordinary bows, with large arrows steeped in the poison, but for small game such as birds and monkeys, large arrows were unnecessary, for the poison would do its work so quickly and surely that a mere scratch was sufficient to kill. The smaller arrows were discharged from an ingeniously constructed blowpipe which could be aimed with great accuracy. These blowpipes were made of reeds which grew to an amazing height, and the sections used were from ten to eleven feet long but did not show the slightest sign of tapering, or of joints. The reeds were of a bright yellow color and were perfectly smooth inside and out, for they grew hollow without any traces of pith or of knots. These reeds were too light and slender to be used alone, so they were pushed down into the hollows of larger coarser stalks that served as cases for them. The end of the pipe which was put to the mouth was bound with a silk grass cord to keep it from splitting, while the other end, which was liable to be injured by striking against trees or against the ground, was covered with a ring made out of the seed of a fruit.

The arrows used in these pipes were from nine to ten inches long, and were made from the ribs of the leaves of a species of palm tree. One end of the arrow was pointed as sharp as a needle and carefully poisoned, while the other end was wrapped with cotton tied on with silk grass, to make it fit the inside of the tube perfectly. The tubes were provided with sights made of the teeth of some small animal, and the arrows flying silent and swift seldom failed to hit their mark and their wounds meant death.

Mr. Waterton procured samples of the "wourali" poison, and both in the forest and at his home in England made a series of experiments to determine its effects and, if possible, to find an antidote. He found that a fowl slightly wounded with a poisoned arrow would sink into a stupor almost immediately and in four minutes would go into convulsions, and would die at the end of five minutes.

Animals dying from the effects of this poison seemed to feel but little pain, and the naturalist when collecting curiosities usually resorted to it as the least painful mode of killing his specimens to get their skins. On one occasion he wounded a captive sloth and put it down on the floor within two feet of a table. Now the *ai*, or three-toed sloth, is of all animals the most tenacious of life and can survive wounds that would kill almost anything else, but this one had barely reached the table when the baneful effects of the poison overcame him, he grasped the table leg feebly, as if to ascend, and then sank back and expired without a struggle. A large powerful ox was tied to a stake and, no large arrows being at hand, was shot with three small arrows. He did not struggle but tried hard to keep on his feet, shivered and started violently from time to time and in twenty-five minutes was dead.

Travellers and settlers told of a number of alleged antidotes for the poison, but the Indians who made it and who might be supposed to know its properties best knew of nothing that would stay its effects, but abandoned all hopes of life when wounded by such deadly arrows by accident or in war. Mr. Waterton tried in many ways to find an antidote for the poison, but in vain, everything wounded with it died except a she ass which he had poisoned in the shoulder with wourali while in England. The poor beast sank down and in ten minutes was apparently dead.

An incision was then made in her windpipe and her lungs were regularly inflated for two hours, when the suspended animation returned, but the artificial breathing had to be kept up for two hours longer. The victim of science finally recovered and was kept in ease and luxury the rest of her days in the park at the naturalist's residence, Walton Hall.

The most remarkable circumstance connected with this poison is that the flesh of an animal killed by it is not injured, but is savory, wholesome food, and will keep as long and as well as if it had been killed by the butcher's knife.

His description of the India rubber tree may prove interesting: "It is large, and as tall as any in the forest. The wood has much the appearance of sycamore. The gum is contained in the bark; when that is cut through it oozes out very freely it is quite white and looks as rich as cream; it hardens almost immediately as it issues from the tree; so that it is easy to collect a ball by forming the juice into a globular shape as fast as it comes out; it becomes nearly black by being exposed to the air, and is real India rubber without undergoing any other process."

It is to be regretted that the author was so modest, for he tells but little of himself or of his own adventures, though an account of his own journeyings would certain-

ly be very interesting, for he lived among the savages in the wildest forest, and travelled at times, as he incidently mentioned, on streams so overhung with vegetation that it was necessary to cut a path for the canoe through obstructing vines and tree tops.

Saying but little of himself he delighted to tell of the birds he saw, of the Toucan, overburdened with its enormous bill, the gaudy little Hummingbirds, the Parrots of variegated hues, and of the Whip-poor-wills and other birds of the goatsucker family that are regarded with superstitious awe by the Indians and also by the negroes who regard them as sacred to Jumbo, that god of African pagans after whom Mr. Barnum's big elephant was named. He said that the birds were so numerous that those he described were "only as a handful from a well stored granary."

After making four voyages to America Mr. Waterton travelled occasionally on the European continent, but lived most of the time at Walton Hall, his family seat.

Walton Hall was an ideal home for a naturalist. It was built on an island in a lake of about twenty-five acres extent, surrounded by groves of fine old trees where birds sang and nested, undisturbed by prowling sportsmen. Here the naturalist lived and studied, the benefactor of his poorer neighbors, and the gentle protecting friend of birds and beasts. He died at the age of 83 surrounded by his children and grandchildren, and was buried beneath his favorite trees. where, as he had predicted, "cock robin and the magpies mourned his loss."

Angus Gaines.
Vincennes, Indiana.

Alcoholic and Other Fluid Preservation.

A great many people suppose that to preserve any small animal or piece of tissue, it is only necessary to "chuck" it into a small quantity of alcohol of uncertain strength and to "cork" up the containing receptacle. A small animal thus treated would be preserved in that it would not undergo thorough decay. From any other standpoint it would be nearly a failure.

Most material which is preserved in fluid is to be used, partially at least, for microscopic examination. In this article I shall attempt to give a few of the leading methods of handling and preserving material which may at some time, be used for microscopical work.

All objects should, as soon as possible, be treated with what is known as a "fixing" or "killing agent." Worms and other small organisms are, while living placed in the fixing re-agent. Large animals as soon as possible after death. For most purposes some of the following three formulae will be a successful reagent.

1st. A saturated solution of corrosive sublimate in 70 per cent. alcohol—dilute with an equal part of pure water and add a trace of some acid.

2d. Picro-sulphuric acid—i. e. a saturated solution of Picric acid in a 2 per cent. aqueous solution of Sulphuric acid.

3rd. Mullers fluid—2½ parts Bichromate of Potash, 1 part of Sodium Sulphate, 100 parts of distilled water.

Filtered rain water may be substituted for distilled water.

All large objects should be placed in 8 or ten times their volume of Mullers fluid. which should be changed in 12 to 24 hours and replaced by an equal bulk of fresh. After staying in this for 2 weeks to a year, tne object after thorough washing in water should be put into 50 per cent. alcohol for a few hours and then placed in 70 per cent. where it may be kept. If the alcohol becomes discolored it should be filtered and may then be used again.

If the object is for museum purposes it may be taken fresh and placed in 35 per cent. alcohol for 4 or 5 hours, then into 50 per cent. for some length of time and finally kept in 70 to 80 per cent. alcohol. using *plenty* of alcohol. The addition of 5 per cent. Hydrochloric acid to the first alcohol improves the condition of most specimens but bleaches many colors and injures calcareous structures.

Objects under an inch in thickness may be placed in Picro sulphuric acid for 20 minutes to 24 hours. Objects under ½ inch in thickness may be placed in Corrosive Sublimate solution for 5 to 30 minutes or in Picro sulphuric acid. After fixing in either of these the object should be rinsed with 35 per cent. alcohol and then placed in 50 per cent alcohol for 1 to 24 hours, then preserved in 70 per cent. alcohol. For "Picro" objects the alcohol should be changed occassionally until the alcohol ceases to be discolored.

Picro sulphuric acid and Corrosive Sublimate solution may be beneficially heated to a blood heat for many objects.

All parasitic worms should be "killed" with either warm Picro sulphuric acid or Cor. Subl. solution.

The various Hydroids and "Jelly-fish" in warm Cor. Subl. solution, plus 17 per cent. Acetic acid.

Crustacea and Insecta should be treated with Cor. Subl., Picro-sulphuric, or the various grades of alcohol. Or, they may be placed in a 10 per cent. solution of glycerine containing 1 per cent. carbolic acid or other antiseptic, and pure glycerine added at intervals until within a day or so the solution contains 30 to 50 per cent. glycerine.

Lignified plant tissue may be kept in 15 to 50 per cent. alcohol. All plant tissues and all algæ may be placed in a 5 per cent. solution of carbolized glycerine which is then exposed to the air until evaporated to a 20 to 30 per cent. glycerine solution; or they may be placed in a similar solution of Potassium acetate being similarly handled.

Special cases may require special treatment for which one must refer to some of the recent books on the subject, i. e. Lee's "Microtomists Vade Mecum" for animal tissues and Zimmerman's "Botanical Technique" for plant tissues.

Both of these contain valuable chapters on the Art as a whole, and treatment of special cases.

Last, but not least, always place *in* the bottle with the specimen—brief but complete data written on stiff paper with lead pencil. The data should include locality and all such particulars as date, etc., and method of "killing", or "fixing" and the length of time in each of the various reagents.

Will C. Hall.

Socks of Asbestos.

A long, lank, slow-voiced Englishman left his native land a score of years ago and settled in Quebec, where he hired out as a laborer in a lumber yard. His great bodily strength, supplemented by his energy and activity, soon won him an excellent position. After he had been at work a number of months he returned one cold winter evening to the capacious, shed-like building in which they all lived. Seating himself comfortably before the pot-bellied cast-iron stove, the open mouth of which

glowed red with heat, he deliberately drew off his long, wet boots. Then a pair of socks, much the worse for Quebec mud, came off one after the other, and his companions saw him cooly fling them into the fire.

They made no comment on his action, but when, almost immediately afterward they saw him reach into the stove with a poker, pull out the apparently blazing socks and, after giving them a shake, proceed with the greatest unconcern to draw them on his feet again they stood aghast.

It was plainly an exhibition of witchcraft. Then they scrambled over one another in their haste to reach the door, through which they burst into the dark.

The next day they called on the manager in a body and demanded the instant dismissal of the Englishman, loudly declaring that they would no longer eat or work with such a monster.

Inquiry being made at once, it was found that the big Englishman had worked in an asbestos factory before crossing the water, and being of an ingenious turn of mind he had managed to secure some of the material out of which to knit himself a pair of socks. When they became soiled he cleaned them in the fire. But such explanations were of no avail with his ignorant companions, and he was compelled to leave his work.

Asbestos is a wonderful substance. Its name comes from a Greek word meaning inconsumable. Fire will not burn it, acids will not gnaw it, weather will not corrode it. It is the paradox of minerals—for a mineral it is, quarried just like marble. Fibers of which it is composed are as soft as silk, and fine and feathery enough to float on water. Yet in the mines they are so compressed that they are hard and crystalline like stone.

Although the substance has been known for ages in the form of mountain cork or mountain leather, comparatively little has been learned as to its geological history and formation. A legend tells how Emperor Charlemagne, being possessed of a table-cloth woven of asbestos, was accustomed to astonish his guests by gathering it up after the meal, casting it into the fire and withdrawing it later, cleansed but unconsumed.

Yet, although the marvelous attributes of asbestos have been known for so long they were turned to little practical use until about twenty years ago. Since that time the manufacture of the material has grown until it can take its place shoulder to shoulder with any of the giant industries of this country. Indeed, so rapid has been its progress and development that there is almost no literature of any kind on the subject, and to the popular mind it is still one of those dim, inexplainable things.

A Chicago dealer in asbestos goods says that the majority of persons who use the substance are firmly convinced that it is all manufactured by some secret process from wool or cotton.—*Chicago Record.*

Winter Birds.

By Morris Gibbs.

There are many more species of winter birds found in the Northern part of the Union than is supposed. Sixty-eight are known to me in Michigan alone, and in one county, and these are divided into permanent residents, sixteen; winter visitants from further north, twenty; half-hardy, or those which occasionally remain with us, or come from the south before winter is fully gone, thirty-two species.

Space does not permit of even a partial description of these feathered friends, which subject themselves to our vigorous weather and lend attraction and entertainment to the months which would otherwise be almost without interest. But a few random notes will be presented to the lovers of our birds, and will, perhaps, form an impetus to the study of this delightful branch of natural history, among general readers.

Of the 330 species and races of birds in the Peninsular State nearly four-fifths spend the winter months in the South, where they range according to their requirements, from the Ohio river to Yucatan.

The Red-throated Diver from the far north, is found in the dead of winter occupying strips of open water on rapid parts of our rivers. The Goosander and Golden-eyed Duck are also found feeding in company in the same space, while the Long-tailed or Old-wife Duck is a rare visitor here in December and January. Our common Loon which nests here each spring, but winters to the South, as I have met with it in Florida, is sometimes seen on our rivers with its northern relative the Red-throated Diver in late February. Two species, which in the extent of their migratory ranges are separated at times by at least 3,000 miles.

Another still more remarkable instance is the record of observation of the Rose-breasted and Evening Grosbeaks in the same piece of woods in early May. The former bird which nests as far North as the forty-fifth parallel, while it winters way South, in Mexico at least. The latter breeding at the far North and only visiting Southern Michigan at irregular intervals. This was a case where the return of the northern bird was delayed from some cause which resulted in the strange meeting of the two Grosbeaks on common ground.

Of the other visitors from the North the Great Northern Shrike or Butcher-bird often appears and merits our protection for its efforts at destruction among the pernicious so-called English Sparrow. Vast flocks of Snow Buntings visit us each season, lending a pleasing, animated feature to the scene as they wheel about above the snow-clad fields, or feed on the seeds of weeds and grasses.

Pine Linnets, Crossbills of two kinds and a few kinds of Hawks and Owls, residents in the northern parts of our state are not rarely seen on our Southern boundaries, while the generally present residents, the Chickadees, several species of Woodpeckers, Tree Sparrows, Snowbirds, Brown Creepers and Goldfinches are seen on occasions during the winter months.

Then there is the regular Shore Lark, which appears from the North to take the place of the Prairie Lark which withdraws to more Southern latitudes for the space of eight weeks or more, usually. This bird feeds in the road or fields, and often alights on the fences, but is rarely seen to perch on a branch.

Large flocks of Cedar, or Cherry birds are often seen, and rarely a flock of the much rarer Bohemian Wax-wing, an arctic species, but in over a quarter of a century of careful observations in Southern Michigan I have not recorded this gregarious wanderer in Michigan.

There are several species of Woodpeckers, the Nuthatches, Brown Creepers and Crossbills, which appear in our village yards nearly every winter, adding a charm to the season which has few other attractions to lovers of animated nature.

Prof. (in Geology) "What is an outcrop?"

Student, "The result of a shave,"

Wants, Exchanges, and For Sales,—*Continued.*

TO EXCHANGE.—Reports of U. S. Government on Botany West of 100th Meridian, 30 plates, 4to, and Botany of 40th Parallel, 40 plates, 4to; both in good condition, for Ridgeway's Manual of N. A. Birds or Nomenclature, in good condition. J. H. RILEY, Falls Church, Va.

TO EXCHANGE.—Old U. S. cents, 32 cal. revolver, and a few sets of eggs, for Ridgeway.s Manual and back Nos. of The Auk. Will pay part cash. P. A. MULTER, Ashford, N. Y.

WILL EXCHANGE. Books, magazines, etc., list on application, for shells, relics, curiosities, etc., or 50 inch ordinary bicycle. Must be cheap. JOHN F. EBERTS, Lilly, Mo. 5w2

FOR SALE—Collection of the following cancelled Columbians, strictly first-class. 75 ones, 25 twos, 30 threes, 115 fours, 50 fives, 40 sixes, 300 eights, 80 tens, 8 fifteens, 2 thirties, 1 fifty, 10 orange specials. Make offers for the lot or for what you want. Cash only. Also have a fine lot of uncancelled. GEO. W. DIXON, Watertown, S. D.

FOR EXCHANGE.—Single barrel, unused, Shattuck gun, 25 brass shells and loading tools complete, for best offer of rare eggs in sets. Raptores preferred. *Especial desiderata* A. O. U. Nos. 131 and 327. THOMAS H. JACKSON, 343 E. Biddle St., West Chester, Pa. 5w4

CORRESPONDENCE desired with live field collectors, on oology, for the purpose of exchanging the coming season. J. S. BURGIN, Blacksburg, S. C.

TO EXCHANGE.—I have a single barrelled, breech loading shot gun to exchange for a camera. Hawk Eye prefered, one for both hand and tripod use. WM. L. JUDSON, Angola, N. Y.

WILL COLLECT birds in meat and eggs, in good sets, with data, for first-class Southern and Western skins the coming season. WALTON MITCHELL, 534 Summit Ave., St. Paul, Minn.

WANTED.—Printing press, chase, 6x8. State lowest price, description. Have for exchange $16.00 worth good stamps, balance cash. JOS. PATTISON, JR., Oak Lane, Phila., Pa.

WANTED.—A complete file of *Sunny South Oologist*. Will give cash or ornithological publications in exchange. HARRY C. OBERHOLSER, 1508 Park St., Mt. Pleasant, Washington, D. C.

NOTICE.—I will give an Ithaca Hammerless Gun, 12 ga., for a "good" Osgood Folding Canvas Boat. Must see boat before sending gun. R. N. WILLIAMS, Tallahassee, Fla.

WANTED.—All the names of amateur egg collectors outside of New York State. ROBERT J. HARDING, Chatham, N. Y. 5w2.

TO EXCHANGE—Foreign stamps. 5 var. Germany, 3 Helvetia, 4 France, 2 Wurtemburg, 2 Belgium, 3 Canada, 3 Bavaria, 3 Austria, 3 England, 3 Italy, 20 mixed, all A. 1., for 50c in minerals, shells or Ind. relics sent me. PAUL L. SCHAEFER, Addison, Ill.

I WILL GIVE Red Phalarope ¼, Red-cockaded Woodpecker ½, Fla. Blue Jay ¼, for a good Revolver, 32 cal., center fire. Must see Revolver before sending sets. R. N. WILLIAMS, Tallahassee, Fla.

WANTED.—Coues' "Key to North American Birds" in exchange for beetles and birds eggs, or pay part cash. EUGENE A. WEEKS, Newport, Herkimer Co., N. Y.

WANTED.—Agricultural Department Bulletin on "Hawks and Owls of North America." State condition and price. Can offer mounted birds. N. RAYMOND REED, Richmond Mills, N. Y.

TO EXCHANGE.—Fresh skins of Oregon Water Birds for ornamental sea shells. B. J. BRETHERTON, Newport, Oregon. 5w2

E b CORNET, $7.50, Apgar's Key, skins 221, 368, 373, bicycle brake, three "shinplasters." Want Ornithological books and eggs in sets. C. F. STONE, Branchport, N. Y.

WANTED —Birds eggs, Indian relics, curios, etc., in exchange for new book, The Flowery Kingdom, and the Land of the Mikado. Write W. A. LEE, New Vineyard, Me.

CURIOS, fossils and buffalo horns exchanged for blocks 12x12 for national silk crazy quilt, from these states: South Carolina, Arkansas, South Dakota, New York, Georgia, California. MRS. FORREST PENDROY, Pendroy, N. Dakota.

TO EXCHANGE.—First-class sets of A. O. U. Nos. (with datas,) 498, 560, 704, 761, 766. WM. H. WARREN, Lock Box 80, Danielsonville, Conn.

NOTICE.—I would be very glad to correspond with collectiors in regard to exchanging sets and singles the coming season. Lt. JOHN W. DANIEL, JR., Bethel Academy, Fauquier Co., Va.

TO EXCHANGE.—First-class eggs in original sets with data for same. Have Nos. 325, 366, 373, 417, and many others. C. W. PRIER, Appleton City, Mo.

WANTED.—To correspond with collectors of eggs. Have some good ezgs in singles. Send for lists. L. M. CLARK, Box 47, Suffield, Ct.

TO EXCHANGE.—Canadian eggs sets and singles, including Ridgeway's 439, 516, 557, 572 574, 473, 263, 382, 390, 41, 155, for Sea-birds' or southern eggs. R. W. JOHNSON, Port Hope, Ont.

EGGS in singles, and novels to exchange for eggs in singles and sets of other localities. Enclose stamp. ELMER FALK, Box 818, Stoughton, Wis.

TO EXCHANGE.—Eggs of Chipping-Sparrow, Field Sparrow' Robin, Yellow Hammer, Barn Swallow, Blue Bird, Flycatcher, and Turkey, for named eggs from other states, also a few stamps. R. J. CLEVELAND, Exeter, Me.

500 SHELLS of *Strombus alatus* to exchange for works on Natural History. A. E. BENNETT, Williamsville, Mass.

WANTED.—Shells and anything curious. Will give, in return, receipe for doing alcohol painting, with full instructions. Will teach how to paint on glass for eggs, or $1 in cash. G. ROSA, Allegan, Mich.

FOR EXCHANGE.—Duplicates in shells, minerals, fossils, stone Indian relics, stamps, old coins, bird eggs, etc. Send lists and receive mine. D. L. DILLING, Sadorus, Ills.

SILVER-PLATED Cornet, slide trombone, and brass bass to exchange for first-class indian relics, or will sell cheap. A. D. GRUTZMACHER, Mukwonago, Wis.

TO EXCHANGE.—About $9 worth of birds eggs, moonstones, stamps, wood specimens, lot of OOLOGISTS, for natural history specimens or cash. GEO. H. BOCKOVEN, Palmyra, N. Y.

TO EXCHANGE.—Mississippi River agates choice fossils and rare stamps for Southern insects, mounted, and in good condition. EARL L. HENDRICKS, Lock Box 150, Savanna, Ill.

GEODES to exchange for curios, minerals or relics. Will take birds or eggs for any party wishing from this locality, insects or anything we have here. J. M. T. MYERS, Ft. Madison, Iowa.

EXCHANGE.—Will exchange mosses and pebbles from the Pacific, also petrified wood, for books on Taxidermy, etc., or old U. S. stamps. STANLEY HOSMER, Box 98, Santa Rosa, California.

WANTED.—Curios from the sea. Will send stamps or Roman or Foreign coins to your satisfaction for any curios sent me. A. W. THOMPSON, Preston, Minn.

EXCHANGE.—Shells, fossils, Indian relics, etc. found in this section to exchange for shells and fossils from other parts. ALLEN JESSE REYNOLDS, Box 802, Connersville, Indiana.

BOX 488, Kewanee, Ill., wishes to exchange choice Cacti, hardy roots, and offers, for sea shells, corals and curios.

EXCHANGE.—I have a few mounted birds, marine shells and curios to exchange for skins and sets. J. A. DICKINSON, Gresham, York Co., Neb.

WANTED.—Correspondence in regard to exchanging Entomological, Oological and Ornithological specimens the coming season. C. HOUGHTON, L. Box 297, Potsdam, N. Y.

FOR SALE —A few sacred pipestone peace pipes from $1.25 to $3.00. Polished pieces pipestone, *catlinite*, 10c to $1 00. Pipes, Tomahawk style. A. D. BROWN, Pipestone, Minn.

FOR SALE.—Flax, said to have grown 100 years ago. From 10c to $1.00 per bunch. Y. S. DAMON, Lxyndonville, Vt.

WANTED.—Birds eggs, skins, Indian relics, minerals, etc., for cash or good exchange. Have mounted birds and Kodak Camera to exchange. A. V. DWORAK, Evansville, Ark.

When answering advertisements always mention the NATURAL SCIENCE NEWS,

WANTED to EXCHANGE, a 38 cal. revolver and 50 foreign stamps for eggs in sets and nest. Write for particulars. FRED K. WARREN, Box. 136, Holley, N. Y.

TO EXCHANGE.—Birds eggs, 22 cal. Rifle, value $3, for best offer in birds eggs. HARVEY G. F. HERR, 514 W. James St., Lancaster, Pa.

WILL EXCHANGE one set of Yellow Warblers eggs and one set of Cedar Birds eggs for the best offer of birds eggs. KIRKE RYDER, Box 166, Worcester, N. Y.

WANTED.—To exchange with reliable collectors, eggs, in original sets for same. Have epecially fine sets of 325, 326 and 610 to offer. JAMES A. LYON, Jr. 602 College St., Clarksville, Tenn.

NOTICE.—Eggs for sale, comprising over 60 varieties from this state. Write for particulars. SCOTT SIMON, Box 492, Youngstown, Ohio.

WANTED.—Correspondents in Southern and Western states, also lists from those having fine eggs for sale cheap. W. J. B. WILLIAMS, Holland Patent, N. Y.

HAVE a number of sets and singles to exchange for *first-class* bird skins, also two volumes of both the OOLOGIST and *Popular Science News*. L. G. WOODRUFF, 202 West 103d St., New York.

WANTED.—Correspondence with persons living in West for the purpose of exchanging insects and eggs found in same but not found in Maine. FRED E. POMEROY, 84 Easton Ave., Lewiston, Me.

I WILL exchange fossils, stamps, eggs, fragments of pottery from W. Ill. and books for Indian relics, coins, eggs, minerals, fossils and books. HARVEY H. BROWNE, Hamilton, Ill.

FOR BEST offer, heads of double headed calf, are prettily marked well mounted heads, joined from birth to one neck. For information address A. H. WHITE, Avonton P. O., Ontario.

LOOK.—For every set with data or skin sent me before Feb. 1st valued at 50c, I will send in exchange six Jumping Beans. Address, F. R. NOBLE, So. N. Drug, Nashville, Tenn.

WANTED.—Eggs, first-class, singles and sets, Apgars Key. Will give in exchange, Philatelic papers, magazines, books, stamps and eggs. EUGENE S. RICE, Box 266, Chester, Vt.

BIRDS EGGS wanted in exchange for a copy of Manton's Taxidermy, an outfit of rubber datas, rubber stamps of all kinds, or will pay cash. Enclose stamp when writing. ARTHUR L. POPE, Sheridan, Oregon.

WANTED.—Coues' Key, offer first class sets of eggs in exchange. KERR & PERHAM, Sandwich, Ills.

EXCHANGE NOTICE.—I have the following first class sets of eggs with complete data to ex. 767 1-5, 721b 1-6, 743a 1-5, 448 1-4, 508 1-3, 360 1-4, 387 1-2, 591b 1-3, 458 1-4, 316 1-2. R. S. DANIELS, Box 126, Nordhoff, Calif.

SALE or EXCHANGE.—Eggs, singles of A. O. U., Nos. 191, 201, 390, 444, 488, 495, 612, 614. Would like repeating air gun or good revolver. Correspondence solicited. TOM MOORE, Genoa Junction, Wis.

FOR EXCHANGE.—Birds eggs in sets with complete data, fossils, for southern eggs, bird skins, fossils, etc. H. A. DUNN, Hoopeston, Ills.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs,** including *Falco tinnunculus*, etc., etc.

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24 inch, nickel plated barrel. Detachable stock, 5 chambers, 38 cal., for extra long brass shells. Light, strong, attractive. No cheap affair.

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Owing to extreme cold weather in Florida, the tourists' travel has been less ONE-HALF, hence trade is less than ONE-HALF. Goods must be sold just the same, so they too, like the rest, go at ONE-HALF price. If you are after REAL BARGAINS in FINE goods look over this list and send in your order at once.

Alligator Claw purse	$ 25
Fine Lizard purse	85
Pearl Shell purse	20
Rattlesnake skin belt	75
Rattlesnake skin bag used to hang from belt	1 25
Pearl Shell Napkin ring	20
Palmetto Fan made from Natural Palmetto leaves	25
Carved Bone pen holders and paper knives combined	15

Shells! Shells!! Shells!!!

Large Cameo	20
Spider Shell	15
Pink Murex	20
Harp Shell	25
Cockle Shell	15
Marlinspike	15
Tent Olive, fine	1 00
Marbled Cone	15
Angels Wings, fine pairs	50
Black Murex	30
Tulip Shell	15
Kid Conch	08
Black mouth Snail	10
Banded Snail	10
Scorpion Shell	15
Parula Shell	08
Large Bleeding tooth	05
Pearl Trochus	10
White Murex	15
Turk's Cap	18
Trumpet Shell	75
Snipe-billed Murex	20
Angel Shell	10

MARINE CURIOS.

Atlantic Starfish 4 in	$ 14
California Starfish	21
Black Bahama Starfish	21
Mammoth Bahama Starfish	48
Brittle Starfish	19
Sea Horse, very fine	18
Sawfish saw, 10 in. perfect	21
Devil fish Egg	09
Skates Egg	08
Hammer head sharks egg	14
Nurse shark egg	36
Sand dollar	07
Hermit crab in shell	19
Key-hole Urchin	23
Sea Biscuit	23
Sea Fan	12
Club-spined Urchin	19
Acorn Barnacle	09
Mammoth Cala. Urchin	20
Spined Urchin, Atlantic	19
Large Tarpon scales	09
Florida Sea Urchin, small	06
Pink Coral, large spray	11
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All goods sent prepaid on receipt of price.

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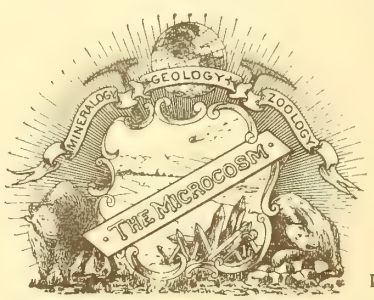

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Natural Science News.

VOL. I. No. 6. ALBION, N. Y., MARCH 9, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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PHOTOGRAPHS. Superb cabinets of birds, nests and scenery for sets of common eggs and skins. Over 100 different subjects. E. B. WEBSTER, Cresco, Iowa.

TO EXCHANGE.—Davie's Nests and Eggs of North American Birds, paper, in good condition. Will exchange for a few fossils. Write and make me your offer. H. J. TWIGGS, Summerville, Augusta, Georgia.

TO EXCHANGE.—U. S. silver and copper coins, some rare dates. Foreign silver and copper coins, value $90, will exchange for large fine shells, minerals, corals, mosses, sponges, birds' eggs; singles or in sets. Will exchange whole cabinet or in part. F. E. WITHERELL, Warwick, Mass.

BEETLES, fossils, plants, land and fresh-water shells, and other specimens in exchange for shells, plants, lichens, and beetles. JOHN C. BRIDWELL, Baldwin, Kansas.

CABINET photographs of American Bittern's nest, containing two young and two eggs, for sets of commonest eggs. E. B. WEBSTER, Creso, Iowa.

BOOKS! BOOKS! books!—Lyell's Elements of Geology, Wood's Class Book of Botany, Bird Notes, Mrs. Lincoln's Botany, Elements of Chemistry, Amt. Trappers' Guide, Tour of World, by Gen. Grant; How Plants Grow, Manton's Taxidermy, Adventures of Stanley, Hooker's Natural History and lots of others. I offer these for books, volumes of natural history papers, climbers, or specimens. What can you offer? What can you use? G. N. UPHAM, Coffeyville, Kan.

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WANTED.—The address of a dealer in Fancy Pigeons, Lop-eared Rabbits, etc. Address, GUY K. BARNES, Strawberry Pt., Iowa.

WANTED.—To exchange with the original collector for sets with datas, of 3, 197, 199, 202, 211, 224, 305, 331, 339b, 360, 366, 378, 611. H. C. HIGGINS, Cincinnatus, N. Y.

I WILL be glad to hear from those willing to give Southern Bird skins for those of Snowflake and Evening Grosbeak. T. McILWRAITH Hamilton, Canada.

CABINET of solid oak, just the thing for minerals, shells, or eggs, to exchange for eggs in sets with data. For particulars address, CLINTON DE. LA. M. CARY, 181 W. 135th St., New York City.

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TO EXCHANGE.—22 cal. Stevens pistol, cost $7.00, press, 12 gague belt, minerals, fossils, curios, for camera, lens, photographic supplies. MORT CULVER, LaSalle, Ills.

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WANTED.—To exchange first-class eggs, single, the coming season for single eggs not in my collection. EDW. I. STREETER, Box 82, Chatham, N. Y.

WILL EXCHANGE Lepidoptera of Missouri and Illinois, for those of other localities. Send list. All letters answered. HERMAN SCHWARZ, 1520 Lafayette Ave., St. Louis, Mo. 6-2w

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WANTED.—Second-hand copy of Hornaday's Taxidermy. Will give mounted birds or pay cash if cheap. Write stating price. H. J. GIDDINGS, Sabula, Iowa.

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FOR EXCHANGE OR SALE.—Eight house lots in Fresno, California, 1 in Grand Rapids, for a Merry-go-round or other offers. G. ROSA, Box 58, Allegan, Mich.

TO EXCHANGE for shells, a nice lot of Moose horns. Write what you have for exchange at once. HUGO LEUSCH, Frazee, Becker Co., Minn.

TO EXCHANGE.—Fossils, stamps, eggs, fragments of pottery, minerals and books, for Indian and war relics, coins, eggs, minerals, fossils, books and stamps. Send list and stamp. HARVEY H. BROWNE, Hamilton, Ill.

LOOK AT THIS!—A large fine spray of pink coral *eylaster sanguineus*, for every set of eggs with data listed over 40 cents. K. B. MATHES, St. Augustine, Fla.

TO EXCHANGE.—Davie's Nests and Eggs of North American Birds, value 75 cents; in good condition, Also a World type-writer, nearly new, cost $7.00, value $4.00, for a set of the Gray Sea Eagle's eggs with data. I have also some single eggs to exchange for eggs in sets with data. Send your lists and receive mine. All letters answered. L. M. CLARK, Suffield, Ct.

LOOK HERE.—I will exchange polished specimens of birds' eye marble, fine calcites or fresh-water shells, for shells, crystals, agates, or Indian relics. C. E. BRIGGS, Lisbon, Ia.

FOR EXCHANGE.—One Winchester rifle, 22 cal. model 1890; fair condition. Will exchange for American eggs, in full sets with carefully prepared data. JOHN W. DANIEL, JR., Lynchburg, Va.

360 OLD U. S. and foreign stamps in Album. What will you give me for them in eggs with data or bird skins. S. A. OGDEN, 506 Day St., Knoxville, Tenn.

ATTENTION. — "Les Miserables" and "By Order of the King," two vols. "Harold," by Lytton, and Manton's "Insects how to Catch and Prepare"; all cloth-bound and in good condition, for a pair of good climbing irons, best offer. MORRIS RICE, Kinloch, Mo.

FOR SALE.—Fresh skins of Peacock, $3.50; mounted Gray-crowned Leucosticte, $1.75; fine Coyote rug, (mounted, half head,) $7. GEO. F. GUELF, Taxidermist, Brockport, N. Y.

FOR SALE.—To every person sending me 80 cents, I will send the best pair of climbers ever made, all steel, climb any tree. R. C. ALEXANDER, Plymouth, Mich.

WANTED.—*At once.* A cabinet for Natural History Specimens. All persons having such for sale, write me at once stating lowest cash price. F. H. KOCH, Box 1036, Peoria, Ill 6w2

WILL EXCHANGE.—Back numbers of Sporting, Bicycling, Stamps, and Oological papers for United States three, two, and one-half cents, in good condition. HORACE E. BUKER, Rockford, Illinois.

LOOK! I will give good exchange in curios, etc., and possibly part cash, for a "Hornaday's Taxidermy," in good condition. WM. GILBERT, P. O. Box 130, Elk River, Minn.

TO EXCHANGE.—Copies OOLOGIST and datas for Davie's "Nests and Eggs of North American Birds" or eggs with data. Send your list and get mine. JOHN W. SOULE, Sandy Creek, N. Y.

TO EXCHANGE.—Will Exchange eggs of Virginia Birds for those of birds west of the Mississippi. Prefer exchanging with the collector Also eggs of water birds for exchange. J. GORDON CRAWFORD, Dalby, Va.

I WISH to exchange Minerals for Indian relics. Those from Eastern States preferred. ISAAC S. KIRK, Fremont, Chester Co., Pa.

WANTED —To exchange specimens of all kinds from this locality, for those of other seacoast preferred. Specimens *must* be fully and scientifically labeled. HARRY C. BUTCHER, Box 465, Galesburg, Ills.

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WANTED. A few yards, ten or fifteen, of unmounted gill netting, about 6 ft. wide, 1 inch mesh. Have 8 Vol. OOLOGIST. A. B. FARNHAM, Benning, D. C.

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TO EXCHANGE.—I have a collection of stamps which I will exchange for Lepidoptera or Entomological supplies or will sell for cash. EDGAR BINGHAM, Stayner, Ont.

TO EXCHANGE.—Unmounted Butterflies from Estes Park, Col., for the same from other places. W. T. PARKE, Estes Park, Colo.

WANTED.—1895 orders for Colorado insects and botanical specimens, scientific data. Prices reasonable. Particulars for two cents. HORACE G. SMITH, 2918 Lafayette St., Denver, Col.

WANTED.—Price lists of Birds Eggs, Fossils, Minerals and Indian Relics. Can exchange stamps for eggs. GEORGE A. FERGUSON, 59 Ambrose St., Rochester, N. Y.

EXCHANGE.—Fifty species (200 specimens) British Columbian Shells to exchange for collection of postage stamps. Write particulars (no postal cards) to REV. G. W. TAYLOR, Nanimo, B. C.

TO EXCHANGE.—During the coming season I would like to exchange with collectors of eggs in sets or singles, outside of Pennsylvania preferred. CHAS. D. QUICK, 4113 Walnut St., Philadelphia, Penn.

PERSONS wishing to exchange or buy skins or eggs of birds indigenous to North Carolina, should communicate with MILTON F. SKEEN, Guilford College, N. C.

WANTED.—Bound or unbound volumes of the *Auk*, published prior to 1890. State lowest cash price and condition. F. L. BURNS, Berwyn, Pa.

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EXCHANGE.—A beautiful photo of Partridge on nest, 4½x3½, for best offers in bird skins eggs, curios, photos, or the like. Send what you have. JOHN H. ELKINS, Box 414, Exeter, N. H.

I DESIRE to exchange first-class sets of Southern birds eggs, collected the coming season, with reliable collectors. H. B. BLAKEMORE, 1310 St. Andrew St., New Orleans, La.

BEAUTIFUL Satin Spar from salt mines 555 feet below surface, for fossils or offers. For sale at 10c to 25c. Also zinc ore. C. E. HOUDYSHELL, Holton, Kansas.

WANTED.—For cash or exchange, marine specimens, (alcoholic). *Cœlenterates. Echinoderms* for laboratory work. Write what you have. O. A. JOHANNSEN, Fremont, Neb.

CALIFORNIA Woods, 10 specimens, $1.00; 25 for $2.00; 1 for 15c. Native Ferns, 15c each MISS IDA C. NICHOLS, Freestone, Sonoma Co., Calif.

WANTED.—To exchange—Botanical Specimens, insects and curios. WM. C. BARBOUR, Sayre, Pa.

(*Continued on next page.*)

Wants, Exchanges, and For Sales,—*Continued.*

WILL EXCHANGE. Books, magazines, etc., list on application, for shells, relics, curiosities, etc., or 50 inch ordinary bicycle. Must be cheap. JOHN F. EBERTS, Lilly, Mo. 5w2

FOR EXCHANGE.—Single barrel, unused, Shattuck gun, 25 brass shells and loading tools complete, for best offer of rare eggs in sets. Raptores preferred. *Especial desiderata* A. O. U. Nos. 131 and 327. THOMAS H. JACKSON, 343 E. Biddle St., West Chester, Pa. 5w4

WANTED.—All the names of amateur egg collectors outside of New York State. ROBERT J. HARDING, Chatham, N. Y. 5w2

TO EXCHANGE. Fresh skins of Oregon Water Birds for ornamental sea shells. B. J. BRETHERTON, Newport, Oregon. 5w2

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FOR SALE or EXCHANGE.—Flageolet, Key of "D," new, German silver trimmings, for Indian relics, minerals or shells. Write. J. GEO. KURTZ, JR., Bucyrus, Ohio.

I WANT a good shot gun. I will give in exchange mounted specimens of animals, birds and California curios, also skins and eggs in sets. J. F. ILLINGWORTH, Claremont, Cal.

TO EXCHANGE.—A 45 cal single action Colt's navy revolver in good condition with holster, for two tennis raquets or one raquet and dozen balls. CHAS. H. JONES, Box 103, Redlands, Calif.

TO EXCHANGE.—One $19 silver watch, one new snare drum and a number of other things for Indian relics. All letters answered. JOHN W. ROONEY, Box 255, Nyack, N. Y.

TO EXCHANGE.—Two Microscopes, cost 2.50 and 50c respectively, for Books or Eggs. Davie's Taxidermy to exchange for Coues' Key and best offer. JAY G. SMITH, No. 5 Pleasant St., Bradford, Pa.

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WANTED.—Natural Science publications in exchange for first class sets and singles with complete data. THE NEBRASKA CITY NATURALISTS' ASSOCIATION, Nebraska City, Nebraska.

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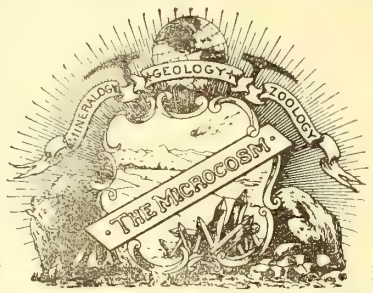

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Natural Science News.

VOL. I ALBION, N. Y., MARCH 9, 1895. No. 6

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Olivella biplicata.

One fine summer morning I rose very early, took my long rubber boots, an old hoe, and a basket, put a few crackers in my pocket, and silently stole away from the little tent among the pines where the rest of my family were continuing their slumbers. I followed the long path which led along the cliffs, here coming down close to the shore, and there cutting off a sharp headland of rocks, till I reached my destination. This was a little strip of sandy beach from which the water had all receded, for it was at the very lowest ebb of the early tide. I sat down on a rock, took a cracker from my pocket, and began to investigate both it and the prospect. In front of me was a strip of sand sloping down to the light waves; behind me was the high bank of earth, and the rocks were on either side; but no shells were to be found except a few well-worn specimens which had been tossed up by some departing wave.

But I was not expecting to find shells in plain sight, so I cheerfully pulled off my shoes and drew on those very convenient appendages, the long rubber boots. Now I was ready for work and taking up my hoe I began to dig in the sand. There was plenty of sand to dig in, in fact too much of it, for it apparently took up all the room and left no place for shells.

At length I struck upon a spot where a little stream of water was oozing out from the bank of sand. As I scraped away the surface, I saw something which would have made me dance for joy had I not been weighed down by the long boots. For there, in very truth, was a live olive, with its graceful shell and a beautiful, pearl-colored body. It quickly withdrew this into the shell and closed the aperture with a very insignificant scale, which seemed to be an apology for an operculum.

I picked up the pretty little creature, and scientifically mused somewhat as follows:

The Latin name for this mollusk is *Olivella biplicata*, Sby., Ol-i-vel-la bi-pli-ca-ta. The shell is about an inch long, apparently smooth and polished, yet showing under the microscope very fine and beautiful reticulations. The spire is short, the aperture long and narrow, the canal a mere notch, and the outer lip thin edged. Upon the inner wall of the aperture is a lump of white enamel, and at the base of the columella are two little folds which are referred to in the name *biplicata*, twice folded. The color of the shell varies much in different specimens; some are almost pure white, others are very dark, but most of them are dove-colored, with purple trimmings. They are about the size and shape of the olives of our orchards, and their name has no mystery connected with it, but doubtless refers to their appearance.

Well, as I proceeded with my hoeing, my joy increased, for I found them by the hundred, and I had gathered about a thousand before the tide came in so far as to render further work impracticable. They seemed to lie in groups just under the surface of the sand, yet wholly concealed from sight. You must go at the very lowest morning tides, if you wish to gather them, and search till you find the bed; for they seem to be active burrowers, and to travel rapidly from place to place.

I took some of them home and put them in a jar of beach-sand and sea-water. You will be pleased to do the same if you ever have the opportunity, for their movements are very interesting. You will then see the plow-shaped foot which quickly digs a hole in the sand, and the long breathing-siphon which curls up through the canal, and reaches through the sand up to the clear water, like the trunk of a swimming elephant reaching up for air.

To clean the shells it is simply necessary to spread them in the sunshine for a few hours, when the animal will be found to be dead and loosened from the shell. The soft parts can then be removed with a pin.

To clean most shells, however, it is necessary to throw them into boiling water. In a few minutes they can be taken out and the animal withdrawn by a little hook or bent wire.

If only a part of the body can be obtained, the shell may be securely plugged with cotton. It is well to fill even perfectly cleaned shells, and attach the operculum to the cotton by a drop of glue. They will then appear as if they were living specimens. Much will depend upon one's time and taste for this part of the preparation, but the thorough cleaning of the shell is indispensible, and should be attended to as soon as possible after specimens are gathered.—*From Keep's "West Coast Shells."*

Animal Life During a Cold Snap.

The recent weather, unusually severe for this locality occasioned considerable suffering among the inhabitants of woods and fields. To me cold weather is one of the most satisfactory times for observing animal life, perhaps because the scarcity of individuals impresses their characteristics on one's mind. This scarcity can be said to be only comparative here however, as we have in bird life a list of forty-seven resident, forty-six winter residents and about ten cold weather stragglers. The thousands of Crows feeding over this region and roosting in a piece of pine woodland north of Washington have suffered severely and dead Crows are quite common. Their favorite feeding grounds, the tidal marshes of the Anacostia River have been covered with snow and ice thus cutting off their most abundant food supply.

Many of the dead and dying Crows are partially or wholly blind. Prof. Ridgway, who resides near the "Crow Roost" referred to, has suggested that this blindness was caused by the freezing and bursting of the eye ball from exposure to the intense cold and particles of snow and ice driven by the wind.

I would rather take it as an evidence of decrepitude or the "removal of the unfittest," as Crows wintering in the Northern States experience much lower temperatures and have remarkably good eyesight as many "would be" collectors can testify.

The Juncos, Song Sparrow, and Cardinals, also suffered severely. In tramping the woods, I picked up a specimen of our only warbler of the winter months, the Yellow Rump or Myrtle, lying frozen stiff in my tracks of two days previous. Many of the smaller birds fell easy victims to the birds of prey, the mink and weasel while benumbed with cold. I saw in many instances the bright feathers of the Cardinal and at least one Blue Jay seemed to have gone to satisfy a hungry Hawk. One of our winter visitors the Shirke also took a hand in the wholesale destruction. The quantities of Quail, Wild Turkeys and Grey Rabbits exposed in the markets have shown man's share in the tragedy.

The legal season on these varieties of game had expired before the heavy snows which made their taking an easy matter, and the enforcement of the game laws would have resulted in much good. A pair of wild ducks, (species unknown) evidently frozen out of the streams flew around and ventured into a neighbors poultry yard for several hours. Among the furred creatures the Mink was most active, impelled by his always excellent appetite he wandered for miles in driving storms, tunneling the drifts, roaming through marshes and travelling both over and under the frozen surface of the streams. Woe betide the unlucky rabbit, bird, or fish he met.

Grey, Red and Flying Squirrels ventured out in search of a meal nearly every day. One stub excavated by Flickers yielded the writer a pair of Flying Squirrels and one Grey.

Many of the Grey's here winter in nests of cedar bark made in the tops of evergreens.

A few blows on the tree trunk sends the half dazed inmates out to fall at the shot of the hunter.

The writer must confess to butchering a family of three at one discharge, in one of these nests several years ago.

The Raccoons showed their great sense by sleeping through such inclement weather.

Two Opossums which had ventured out were captured, one tracked to his hole and dug out, and the other caught running itself in the top of a dogwood sapling. Foxes of course enjoy wintry weather and suffer little from either dogs or men while deep snows last.

The Muskrats ventured out but little perhaps gathering a few grass roots or coming out at an air-hole to devour a meal of mussels which they "shuck" as expertly as an oyster-opener.

These wild creatures seem little disturbed by civilization and settlement, building their mud huts annually within gunshot of the Benning Road where it crosses the Anacostia.

This road ranks second in anount of travel of any entering the National Capitol.

ALBERT B. FARNHAM,
Benning, D. C.

Alcoholic and Other Fluid Preservation for Museum Purposes.

The fluid preservation of Natural History specimens for Museum purposes, differs slightly from that of specimens designed for Microscopic purposes. The chief aims are, 1st to preserve the natural shape and size, and 2nd to preserve the natural colors, transparency, etc.—

The most common preservative is alcohol: which has several faults and several features which offset these faults. Alcohol causes shrinkage and consequent distortion, but this may be partially obviated by careful methods. It bleeches a great many colors. It is costly. But it never freezes; it hardens objects so they are not afterward deformed by pressure, etc. It preserves histological structure fairly well.

To preserve a small Vertebrate in alcohol, it is necessary 1st to remove any slime or mucous present, 2nd, to inject strong alcohol into the alimentary canal through the mouth and vent, 3rd, to make incisions so as to permit the preservative to enter the thoracic and abdominal cavities.

Slime and mucous may be easily removed with a cloth wet with alum water, i. e. saturated aqueous solution of potash alum.

After the foregoing preliminaries are finished the specimen should be placed in about 35-40 per cent. alcohol for from two hours to not more than 2 days. and then transfered to about 80 per cent alcohol in which it is to be kept. If the specimen is delicate it may be well to transfer it from 40 to 60 per cent alcohol for a few hours and then placed in 80 per cent for permanent preservation. This will prevent skrinkage in most objects.

The amount of alcohol used in each process should be, at least, 3 to 5 times the bulk of the object; and the specimen should not take up more than a third of the final receptacle. If, after a time, the alcohol becomes discolored it is a sign of the alcohol becoming weakened, and it should be replaced by fresh.

If jars with a rubber seal are used, the top of the jar and the rubber should both be wiped *dry* and anointed with vaseline before sealing.

If the jar is tightly sealed the vaseline prevents evaporation. Corks for bottles should be vaselined.

Some persons advocate the addition of 5 per cent Hydrochoric acid to the first alcohol. This partially prevents shrinkage, and the glueing together of the viscera, but it is injurious to colors and is usually not necessary.

A preservative is now coming into use which is much praised by those who have used it. It is a 40 per cent solution of Formic Aldehyde and is sold under the name of Formalin.

This may be used in any strength of aqueous solution from 5 to 100 per cent. It preserves the natural color and transparency of most specimens; hardens them and does not cause shrinkage. It has one fault, its solutions freeze; but for that matter most collections are kept in warm buildings.

The use of formalin for hardening specimens for microscopic work is alternately praised and condemned. It is deserving of a further trial in that line. Objects to be hardened in formalin must undergo the same preliminary treatment as for alcohol. The fluid should be changed once, at least, between the first and second day,

In preserving in any medium the specimen should be kept near the top of the fluid, either by a bed of cotton or excelsior or suspended by a string.

Formalin may be bought of any wholesale drug firm at about $1.50 per lb.

The larger Crustacea, Mollusca, etc., may be preserved as are Vertebrates.

The smaller Crustacea, Vermes,

Hydroids, etc., should be preserved as for microscopic work.

Algae and, for that matter, all plants may be preserved, as for Microscopic work: in Glycerine, solution of Pottassium Acetate, etc.

Fruits may be preserved in a cold saturated solution of Salicylic acid, or lacking that in a 2 to 3 per cent aqueous solution of Carbolic acid, to which 5to10 per cent of Glycerine is to be added. The solution of Carbolic acid discolors some fruit. Formalin would probably act well although I have never tried it. Some have recommended the solution of Salicylic acid for Vertebrates, etc., and report good success; formalin is probably much better.

Will C. Hall,
Creston, Ia.

A Cabinet. The Kind I Use.

I have heard so much about the kind of a cabinet one should use, and since everybody has one to reccommend, I venture to mention the kind I have been using for several years.

Of course the consideration of a good, properly made cabinet is no trivial matter, as every naturalist and oologist well knows.

A good cabinet is essential to success in the keeping of specimens, and adds much to the appearance of the collection. My cabinet is simply a number of shallow trays with hinged covers, arranged on tables, placed in a room devoted to no other purpose.

The trays are made of light wood in two sizes, namely large size, five feet long, two feet wide and five inches deep. The smaller size are the same dimensions, except being only three and one-half feet long.

Around the inside of the trays I nail a narrow cleat about a quarter of an inch below the top edge; then a piece of glass is cut to fit in the tray, and rest on the cleats. The trays are painted white inside and light green outside, and then my cabinet is finished.

Made in this manner, the lids can be closed without interference with the glass.

The way I use these trays, is this—I buy a number of small pasteboard trays of different sizes; place my specimens in the proper sized, small trays, arrange them in the large wooden trays, place in the glass top and it is complete. These trays I have used for over three years with the best of satisfaction. They are quite simple and can be made at a very small cost.

When exhibiting to friends or visitors, the glass top serves to keep off dust and meddlesome fingers, but, except on such occasions, I would advise to always keep the lids *closed* as some eggs will fade if exposed to the light too much.

I find these trays excellent for eggs, minerals, shells, entomological specimens, etc., and have never had any trouble from dust or insects. If space is limited they could be placed on shelves. I might add, I always keep a small piece of camphor in each tray.

I have three of the large trays, and ten small trays. Of course the smaller ones are easier to handle, but the less handling, the better.

Morris Rice.

The Spreading Adder; Hog-nosed Snake.

Heterodon platyrhinus.

The *Heterodon platyrhinus*, Latreille is the strangest in its behavior and most singular in its appearance of all our native serpants. It is also one of the most common, and is still found in localities where all other snakes have been exterminated. The number of young produced in a season is great enough to partly account for its surviving where the less prolific rattlesnakes and copperheads have perished.

The distribution of the genus *Hetrodon* is over the whole United States except the Pacific Slope. No members of this genus are found in Mexico, yet in temperate and sub-tropical South America there is a genus, *Lystrophis* Cope, resembling the *Hetrodon* very closely, differing only in having its scales smooth instead of distinctly keeled like the latter. A closely related genus is also found in Madagascar, (*Lioheterodon Dum.* Bibr.) but it has the anal plate entire.

The *Hetrodon platyrhinus* is the species most common in the Eastern United States, but west of the Mississippi river it grows more and more rare until it disappears entirely, being replaced by the H. *simus nascius*, a smaller but closely allied species which has very much the same habits, and is remarkable for making the same demonstrations of hostility when disturbed. Dr. Yarrow states that he found the last named species as far south as Mineral Springs, Arizona.

The *H. platyrhinus* rivals the *Eutaenia sirtalis* in the extent of its variations, and the diversity of its colors. On the dorsal surface the ground color may vary from a dirty yellow, through various gradations of reddish brown, brick red, uniform grey, olive brown, blue-black and jet black, with or without markings. They are also to be found sprinkled over with irregular specks and blotches on a gray ground, but the majority of specimens, when not uniformly colored, are marked with three series of from twenty to thirty dark spots, alternately arranged, and usually fading gradually into the ground color.

Individuals differing so greatly in color were formerly regarded as well marked varieties, and the black ones were even classed as a distinct species and named *H. niger*. These variations, however, gradually shade into each other, the extreme types have been found mating together, and great diversity of color may exist in the offspring of one female.

Besides the elongated and unusually large left lung the *H, Platyrhinus* has a well marked rudimental right lung, though there is considerable variation in the size of the lung itself and in the tube (bronchial foramen) which connects it with the trachea. Some specimens are found to have well developed cartilaginous half rings in the bronchial foramen, while the foramen of others is entirely destitute of cartilage. The rudimental lung is often so nearly hidden that it is difficult for a novice to discover it.

The trachea does not enter the left lung at its anterior extremity, but extends farther back and enters it near the apex of the heart. Turn the snake upon its back and after ascertaining the position of the heart make a longitudinal incision through the abdominal wall, draw the œsophagus to the left side of the body, and you will find the trachea passing to the left side of the heart, and near its apex entering the lung. Make a longitudinal incision in the trachea and the foramen will be seen piercing the cartilage near the apex of the heart. Insert a bit of horsehair in the opening, and by watching its course through the semi-transparent tissues you may explore the rudimental lung.

This tracheal lung is functional in certain snakes, and it may be of service to the *H. platyrhinus* when its main lung is oppressed by the overcrowded alimentary canal,

Among marine water snakes, it serves as a swimming bladder, and when inflated it gives the frightful and threatening appearance to the venomous species (*solenoglypha.*) Prof. Cope says that the *H. platyrhinus* inflates its diverticulum in this way, but I have never seen it resort to this method of displaying its anger.

The action of these snakes when molested are remarkable, but are not always the same in different individuals.

One that I teased spread out its head and anterior third of its body very flat and broad, inflated the posterior portion of its body to more than double its normal diameter, raised its head from four to six inches from the ground, and emitted a series of vigorous hisses, "similar," as Prof. S. F. Baird says, "on a very small scale to an engine letting off steam." In this attitude it bore a startling resemblance to the hooded cobra. Its head had a black band running from the eye to the corner of the mouth, and a dark band from one eye to the other, and another across the occipatal plates suggested the "spectacle marks" of the *Naya.*

I did not strike the reptile but threatened him with a switch until he abandoned his threatening attitude and tried to crawl away. It frequently happens that these snakes after making the most extravagant demonstrations of hostility, will turn upon their backs and lie still until they are left alone, when they will quickly recover and glide away. Mr. C. S. Brimley the Naturalist and Collector, of Raleigh, N. C., a careful observer who has had wide experience with snakes of many species says, that of several of these snakes kept by him one appeared to die when first captured, but could with difficulty be induced to repeat the performance, although it persisted in hissing and "spreading" whenever approached.

Another would only spread itself a little and never would "die," while a third, the most violent of all at hissing and spreading "died" on the slightest provocation.

Dr. Weir describing, in *American Naturalist* what he calls "a perfect act of letisimulation" in this case he says, "The snake bent back and drew his widely open mouth violently along his body, as if endeavoring to rip himself open. He then turned upon his back and *died* at once."

When in this attitude of apparent death the snake is usually described as being perfectly limp, though I have sometimes found it to be rigid, the body drawn in unyielding curves.

On one occasion two were brought me that had been tied with a string and carried four miles on a stick. They had both received the same harsh treatment, but only one of them was in a state of apparent death, the other still struggling vigorously. Untieing the apparently dead snake, I put it in a bucket of water and it came at once to the surface, back downward. Taking it in both hands I attempted to hold it in a more natural position but it persistently turned its ventral surface upward, exerting considerable force in doing so, but making no other strug gles for some time, though it finally resumed its normal position and tried to escape. These snakes were placed in a box of not more than half their own length, yet in spite of rough treatment and close quarters they ate toads the day after their capture.

Another time five small snakes of this species were brought me, all apparently dead. On putting them upon the ground I found that three of them persistenly turned upon their backs, while the other two would lie in a normal position. They were kept separate and all soon became active, but only the three that turned upon their backs lived, the other two dying that night. This would seem to indicate that two of them had been really injured while the other three had been merely thrown into a fit, or, according to the prevailing opinion, had simulated death. If they did deliberately simulate death why did they not assume the natural position kept by the fatally injured ones?

I have found but one writer who protests against the theory of letisimulation as an explanation of the actions of the *Heterodon*, and he suggests, in *Popular Science News*, that the snake turns on its back as a sign of complete surrender and an appeal for mercy. This explanation appears even more improbable than the first, and I believe the true view may be found in G. R. O'Reillys' account of the somewhat similar actions of the cobra. *Popular Scieuce Monthly.*

Mr. O'Reilly says that the most striking peculiarity of that serpent is "the fit of temporary lockjaw into which he is liable to fall," for he sometimes gives his captors "a most wonderful exhibition of reptilian hysterics—lying motionless, half on his back, with his mouth fixedly open and as stiff as if in death."

I suggested to Mr. Brimley that the actions of the *H. platyrhinus* might not be voluntary, but merely "reptilian hysterics," or fits of temporary lockjaw," but he insisted that the reptiles were really shamming, for they would lie still as long as they were molested and recover as soon as they were left alone. Cobras, however, recover as soon as they are thrown down, and this does not lead Mr. O'Reilly to regard them as letisimulants.

In considering this matter the questions would naturally arise, how does the snake know that it will some day be dead, and that snakes that have turned upon their backs dead will not be molested? By the way, do dead snakes lie upon their backs? My experience would lead me to answer the last question in the negative. Dr. Weir thinks that as snakes eat only living food they imagine that other animals have the same tastes, and so simulate death to make themselves appear unpalatable. Rev. Samuel Lockwood deprives this argument of part of its force when he assures us, in *American Naturalist.*, that he has known this snake to eat the heads of eels left on the river bank by fishermen.

ANGUS GAINES,
Vincennes, Indiana.

(*Concluded next week.*)

An Albino Deer.

Last October, while on Moose River, near Brassna Lake. in this county, Mr. O. E. Libby of Detroit killed two buck deer, one of which is pure white with the exception of part of the head, which is brown. The brown extending from back of the ears around the base of the horns to the eyes. The ears are dark, almost black on the outside, while the inside is mostly white. This deer is now mounted and on exhibition in a store window in this place. It is a handsome specimen, and attracts much attention.

C. H. M., PITTSFIELD,
Somerset Co., Me.

BLACK FOX.—Had a rare specimen brought in day or two ago. A Black Fox (*Vulpes argentatns*). Have made it up in a nice skin with skull, &c. It is jet black except tip of tail is white and on the rump are a very few silver tipped hairs.—CHAS. K. REED, Worcester, Mass.

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Lockport.....		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
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If you are a first-class taxidermist, you do not need this method, for you have already spent years in learning the trade; however, you could learn a valuable lesson in the art of posing of a bird, for this method is superior to all others in this respect.

But it is to the beginners that my process appeals.

There are thousands of boys and girls, as well as grown persons, who wish to mount specimens, yet who have no means of learning.

It costs from **ten to fifty dollars** to take a course of instruction from a competent teacher, in the art of taxidermy, and at those figures, the best points are not learned.

It takes from **$5 00 to $ 0 00** to buy a good work on Taxidermy, and it is a well known fact that without assistance, few, very few, succeed.

If you purchase, this process, it will cost you **75 Cents** for one pound of the Compound, and the printed instructions.

One pound of the Embalming powder will fully prepare and preserve 40 to 50 small birds, and it is guaranteed to keep 20 birds the size of a robin, forever.

TESTIMONIALS.

Testimonials from boys are to be expected and I have hundreds of them; but I, also have over (200) letters of commendation from leading professional men, doctors, ministers, professors of first-class colleges, and even regular taxidermists have advocated and extolled my process; while parents, of children who were too young to write, have told of the success of this method, and which they have taught to their children.

A Few Testimonials.

Have found your process a success. Birds that I mounted look well. Am satisfied.
F. A. NORTON, Normal School, Ypsilanti, Mich.

Your process works well. I am thoroughly satisfied.
L. B. HARTZELL, Crystal Springs, Kas.

The instructions and embalming compound received. My son is making rapid progress for one so young. Is filling the house with mounted birds. D. F. STUCK, M. D.

DEAR SIR:—The process is a great success and gives me much pleasure. My little girl can mount birds in a life like manner after two weeks' practice, much to her delight. She is eleven years old. My boy of fourteen succeeded at the first attempt. Your method of shaping the body and wings is superior to all others. MRS. H. B. JOHNSON.

Swindles!

Counterfeits!!

Imitations!!!

There are many imitations of this process and they are all advertised as **just as good!**

The truth is, they are worthless productions; the preparations being composed of inert incredients put up by irresponsible persons, while the directions are invariably merely garbled copies of my instructions.

The ingredients of my compound cost heavily, even at wholesale, but by purchasing largely, and by a superior process of mixing these poisons, there is a small profit if many orders are taken.

"$100.00 Reward!"

Many are unbelievers as to the efficacy of this compound, as they think it cannot preserve flesh.

One Hundred Dollars Reward

Will be paid to the person proving that one ounce of the compound will not preserve one-half pound of beefsteak, porksteak, mutton or fowl, forever. The meat can be hung in the sun immediately after it is prepared, and will never be infested with fly blows.

Will Meat Shrink?

Certainly it will! But by a method which is fully explained in the instructions, this shrinkage is easily, and fully compensated for in a simple manner, and the specimens require less attention than specimens mounted in other ways.

Specimens which I mounted by this method over twenty years ago, look well today and hold their freshness and shape much better than with birds mounted in traditional style (stuffed).

Questions answered fully if letters contain stamps.

Price of Instructions and one pound of Compound, enough for 20 to 40 small birds, 75 cents.

Fewer tools required than in any other method. Only a knife, file and wire required. The quickest method, and entirely satisfactory.

Mention the NATURAL SCIENCE NEWS, and address all letters to

MORRIS GIBBS, M. D.,

KALAMAZOO, MICH.

Natural Science News.

VOL. I. No. 7. ALBION, N. Y., MARCH 16, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WILL SELL, 75 hand-painted North American birds, life size, and color at a greatly reduced rate. Write for particulars. WALTER G. SAVAGE, Hillsboro, Iowa.

WANTED.—A cyclometer for a 28 inch wheel. Also a bicycle bell and a luggage carrier. Can offer camera and foreign birds' eggs, sets or singles. W. J. WIRT, Gaines, Orleans Co., N. Y.

WANTED.—Copies of all old numbers of amateur Ornithological and Oologic l publications. I will pay cash for same if cheap or give good exchange in eggs or stamp magazines. Send lists with your lowest cash or exchange prices to WALTON MITCHELL, 534 Summit Ave., St. Paul, Minn.

WANTED. — Parts 6 to 8 of Picturesque Hawaii, back numbers of scientific magazines scientific books and reports. Send lists and prices. W. C. BARBOUR, Sayre, Pa.

WANTED.—Shells in exchange for moss and cacti. MARY HERHOLD, Box 92, Sheridan Montana. 7w2

TO EXCHANGE.—Butterflies of Western Pennsylvania, for butterflies of U. S. not in my collection. I would prefer unset specimens. JOHN BRIGHT, Roup St., Pittsburg, Pa. 7w2

WANTED.—Government reports on Ethnology, Entomology, Botany, Ornithology, Oology, Anthropology, Mineralogy and Lithology. State price. Must be in first class condition. BOX 414, Canton, Ohio.

HAVE a Crown fountain pen and case in good condition. Cost $3 at World's Fair. Will sell for best cash offer. L. G. WOODRUFF, 202 West 103d St., N. Y.

CASH paid for books on N. American or Ohio birds. A new water blower, eggs and old coins, for climbers, etc. EMMET D. AUSTIN Randolph Portage Co., Ohio. 7w2

WANTED.—Canceled Columbian stamps. 6c. 15c, and higher. I have Duncan's Masonic Ritual; New System Bee Management, Drawings and Specifications for controllable bee hive. MRS. AUSTIN DUSTIN, Box 488, Kewanee, Illinois.

LOOK!—For every three arrow heads sent me I will send postpaid, one gun-flint. I also want a bird egg collector for 1895. HARRY WILLIAMS, Portage, Wis.

TO EXCHANGE.—Font metal bodied rubber type, 5 A, 18 a, 3 sets of figures, (new) not used Also nickel plated type holder, and self-inking pad, cost $3 75; Best offer over $5, in cabinet minerals, shells, etc., takes it. Specimens must be showy, of fair size and named. Send list. C. E. PURCELL, Burlington, Iowa.

TO EXCHANGE.—A Quackenbush rifle, in fine condition, 450 long cartridges, a single barrelled top snap Champion gun, for a 12 or 16 double barreled gun. L A. BEHRENS, Ivoryton, Ct.

WANTED. — Catalogues of all dealers in poultry and supplies; also addresses of all teachers in tax. State prices. J.A. MUENCH, 6743 State St., Chicago, Ills. 7w2

NOTICE.—I can collect this coming season, eggs of the California Murre in large or small lots with complete data, for cash or exchange. PHIL K. GILMAN, 170 9th St., Oakland, Cal.

WANTED.—In exchange for Story of Man, Living World, Sea and Land, World's Wonders. What have you to offer? BOX 414, Canton, Ohio.

FOR SALE CHEAP — Printing presses. 5¼x8½ rotary, 6x9 hand inker, and army. Enclose stamp. H. M. DALRYMPLE, Baker, Ohio.

WILL EXCHANGE Lepidoptera of Missouri and Illinois, for those of other localities. Send list. All letters answered. HERMAN SCHWARZ, 1520 Lafayette Ave., St. Louis, Mo. 6-2w

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FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

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INDIAN Relics of great value for sale or exchange. Addresses of collectors wanted. Interesting collection postpaid for 24c in stamps. THE ARCHÆOLOGIST, Box 502, Columbus, Ohio. 3-w4

WANTED.—*At once.* A cabinet for Natural History Specimens. All persons having such for sale, write me at once stating lowest cash price. F. H. KOCH, Box 1036, Peoria, Ill. 6w2

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FOR EXCHANGE.—Seven hundred stamps in a Scott's International Album, worth $18, a gold-banded fountain pen, $1.50, and a hunting knife and sheath, $1.50; for best offer in Indian relics, birds' eggs, repeating rifle, telescope or banjo. GEO. H. PEPPER, Tottenville, S. I., N. Y.

FOR SALE.—Rusty Song Sparrow, 581e; a pair of fresh skins sent to any address on receipt of 65 cents. B. J. BRETHERTON, Newport, Lincoln Co., Oregon.

TO EXCHANGE.—Rare fossils, shells, old U. S. stamps, Confederate stamps and bills, for any variety of live and healthy Quail. JASPER WOOLDRIDGE, Austin, Texas.

CYCLOPEDIA of Natural History to exchange. Manilla binding, in six volumes, strictly scientific, over 1,000 pages. I desire Indian relics, or Davie's Nests and Eggs, (cloth) and Apgar's Key. Make offers. L. V. CASE, Geneseo, N. Y.

TO EXCHANGE.—For stamps, winter, summer and Canadian photographs, 3½x3½ at 20c each. Right to reject stamps. MARSHALL DUNNING, Briggs Pl., Rochester, N. Y.

TO EXCHANGE — One splendid mounted young deer head, with the velvet on the horns, I would like to exchange for Black Bear skin for rug. Must be nice. WILLIAM RADDER, Attica, N. Y. 7w2

FOR EXCHANGE.—Garnets, rough and polished opals, for ores, petrified wood, polished agates, crystals, skins, stamps or cash. ROBERT BURNHAM, Dennis, Mass. 7w2

FOR SALE.—For best cash offer over $3.50, 45 skins, defective in some way; some in fair condition, including 8 Western Evening Grosbeaks, 5 Red-breasted Sapsuckers and other desirable skins. Sent at purchasers expense. GEO. and CHAS. KEADING, Dry town, Cal.

TO EXCHANGE.—I will give 100 used Columbian stamps for the best birds egg offered me. Write. FRANK C. NEWCOMER, Box 77, Mentor, Ohio.

FOR SALE.—A first class folding camera with tripod and complete outfit. Camera has been used only three times. Write for particulars. JOSEPH I. LAWRENCE, 123 West St., Worcester, Mass.

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Correspondence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N. Y. tf

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WANTED.—Sample copies Natural History papers, addresses of directory compilers, foreign coins and bank bills, Confederate notes and bonds; old State and Colonial bills, fractional currency; government reports. I will pay cash. Antique hair trunk for sale. F. L. ENGLEBERT, Nicetown, Phila., Penna.

WANTED.—Any species of American birds, either skins or sets of eggs, in exchange for British sets. Only a few species left. All must be first class. FRANK HARRIS, La Crescent, Houston Co., Minn.

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I WANT to correspond with every oologist in the U. S. and would like to exchange specimens. A. J. McKAY, Girard, Kan.

EXCHANGE.—Utah minerals, salts, sulphurs, and curios—such as chips of granite from Mormon Temple, sands from Great Salt Lake, for Indian relics, corals or crystals. W. C. MABRY, 33 E. 3d South St., Salt Lake City, Utah.

WANTED.—The price of buffalo horns in the rough, and mounted. Western answers preferred. W. H. PECK, Ekalaka, Mont.

FOR SALE or Exchange.—Elegant specimens of *Cecropia* and *Promethus*, also specimens of local Reptilia and Batrachia. Send for some of our "magic photos" with chemicals and directions, for 10c per box. Great fun! Fools everyone. C. E. CUMMINGS, 560 Auburn Ave., Buffalo, N. Y.

TO EXCHANGE.—Four books: Force, Heat, Light, Water.—Abbott. For best offer of eggs in sets with data or books on Oology and Ornithology. R. W. HEGNER, Decorah, Iowa.

WANTED.—Eggs in sets with data. Can give, for same, foreign stamps, books, eggs, magazines, etc. GARTH EVERSON, Box 102, Lake Mills, Wis.

WANTED.—A pair of Wood Ducks in the meat. Will give good exchange in mounted birds, or will pay cash. J. S. ALLWOOD, Hecla Works, N. Y.

TO EXCHANGE.—500 var. Foreign Stamps, also Philatelic Literature for reading matter. F. L. OWENS, Brooklyn, Iowa.

EXCHANGE.—15 2c envelope, 12 4c, 5 8c, 2 10c, 5 5c Columbian stamps for arrow heads, minerals or good sets with data. WM. F. SHAW, JR., Ithaca, Michigan.

SINGLE eggs to exchange for sets with data. Double value in stamps given for sets. Send your eggs to W. G. STUTZMAN, Kent, O.

STAMPS.—25 varieties for every set of eggs or skin. Stereoscopic views of birds; eggs; minerals; fossils and woods for sets, skins, insects or supplies. E. DWIGHT SANDERSON, 503 Hollister Blk., Lansing, Mich.

WANTED.—First class specimens of water birds, hawks and owls, for which I can offer Southern California sets. EARLE PARKER, 200 W. California St., Pasadena, Calif.

I HAVE 3000 stamps, 1000 varieties and some fine geological specimens that I will exchange for geological specimens, shells, curios, etc. Correspondence with geologists solicited. CLAYTON E. RISLEY, 9 Highland Ave., Middletown, N. Y.

TO EXCHANGE.—Old U. S. Stamps, Confederate Bills, land shells and rare cretaceous fossils, for a printing outfit, electrical goods or cash. JASPER WOOLDRIDGE, Austin, Texas.

WHAT HAVE you to exchange for a good collection of stamps in the way of bird eggs and publications on taxidermy and oology. G. B. HARDY, Abingdon, Ill.

FOR EXCHANGE.—Single barrel, unused, Shattuck gun, 25 brass shells and loading tools complete, for best offer of rare eggs in sets. Raptores preferred. *Especial desiderata* A. O. U. Nos. 131 and 327. THOMAS H. JACKSON, 343 E. Biddle St., West Chester, Pa. 5w4

MINERALS.—25 nice specimens by mail, 35c. W. S. BEADLES, 814 W. Marshall St., Richmond, Va. 7w3o

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When answering advertisements always mention the NATURAL SCIENCE NEWS.

To Close Out.

I will send prepaid for next **30 days only** (until April 15th) the following specimens, at prices quoted:

Egg of Skate, 3c; per doz., 25c.
Egg of Hammerhead Shark, 10c; 2ds, 6c; selected 15c.
Lucky-tooth of Cod, 4c.
Sturgeon Plates, 6c
Egg of Nurse Shark, 35c.
Fossil Shark Teeth, 3 to 10c.
Alligator Teeth, 2 to 25c.
Saw-fish Saw, 7½ in., 18c.
" " 30 in. long, 6 in. wide at base, $2. by express at purchasers expense.

Porcupine Fish, very fine, regular $1 size, only 50c; 2ds. 35c; selects, 75c.

Kaori Money, Money Cowries, *Cypraea moneta,* each 2c; doz , 15c; 100 for 75c.

Orders under 25c must contain 5c. extra for postage and packing.

These prices are made in order to "close out" the items mentioned. Should you wish to purchase the Gator teeth, Skate eggs, Hammerhead Shark eggs, Lucky teeth of Cod, Porcupine Fish or Money Cowries in large lots I would be pleased to make you special quotations. Address quick.

FRANK H. LATTIN,
Albion, N. Y.

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A 1 alcoholics now on hand. Date and locality with each specimen.

Engystoma carolinense	$ .25
Rana halecina	.20
Rana clamata	.20
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Hyla pickeringi	.30
Hyla carolinensis	.30
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Acris gryllus	.15
Bufo lentiginosus americanus	.30
Bufo valliceps	.50
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Collectors Dealers,
and Taxidermists,
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Direct from old historic St. Augustine, prepaid for $1.25.

Mounted Alligator	$1 50
Specimen Coquina	25
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10 Specimens named Shells	1 00
Fine Specimen Palmetto Cloth	25
Specimen Spanish Moss	25
Fine Branch Coral	25
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Two var. Sea Beans	20
	$4 30

Sent PREPAID FOR ONLY **$1.25.**

K. B. Mathes, St. Augustine, Fla.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Mounted Specimens at a Bargain!

All specimens are strictly first-class, mounted on walnut perches.

Widgeon	$2 25	Shrew Mole	1 00	Pin-tail Duck, in wall case	5 00
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Wood Duck	2 00	Chachalaca	3 00	Short-eared Owl	2 00
Sora Rail	1 25	White-tailed Kite	3 00	Barred Owl	2 00
Bartramian Sandpiper	1 75	Sharp-shinned Hawk	1 75	Screech Owl	1 50
Gray Fox	6 00	Nighthawk	1 25	Great Horned Owl	3 25
Red Fox	8 00	Arkansas Kingbird	1 25	Saw-whet Owl	1 75
Raccoon	4 00	Stellar's Jay	2 00	Burrowing Owl	1 75
Weasel	2 25	Oregon Jay	2 50	Scaup Duck, in wall case	5 00
Ermine	2 75	American Crow	2 00	Mountain Lion	25 00

SKINS.

Holboel's Grebe	$ 75	Black Duck	$1 00	Redpoll	$ 15
Pied-billed Grebe	60	Peacock	3 50	Blue-winged Teal	50
American Herring Gull	75	Wilson's Snipe	40	Shoveller	1 00
Red-breasted Merganser	1 00	Great Yellow-legs	60	G't Blue Heron, fall plum.	1 25
Sharp-shinned Hawk	50	Marsh Hawk	65	" " spr'g "	3 00
Goshawk	1 25	Sparrow Hawk	25	Screech Owl	50
Hairy Woodpecker	20	Short-eared Owl	75	Meadowlark	20
Rusty Blackbird	20	Stellar's Jay	75	Snowflake	15

ROUGH SKELETONS.

Red Fox	$2 00	Great Blue Heron	$ 75	Muskrat	$ 35
Red Squirrel	20	Mink	50	Parrot	40
Screech Owl	25	Brown Bat	25	Northern Shrike	25
		Horned Lark	50		

We have just issued our new price list of **Bird Skins, Mounted Birds** and **Mammals,** and **Custom Work in Taxidermy.** Send for a copy.

RAW FURS BOUGHT IN SEASON.

GEO. F. GUELF,

PRACTICAL TAXIDERMIST, BROCKPORT, N. Y.

Florida Goods at One-half Price.

Owing to extreme cold weather in Florida, the tourists' travel has been less ONE-HALF, hence trade is less than ONE-HALF. Goods must be sold just the same, so they too, like the rest, go at ONE-HALF price. If you are after REAL BARGAINS in FINE goods look over this list and send in your order at once.

Alligator Claw purse	$ 25
Fine Lizard purse	85
Pearl Shell purse	20
Rattlesnake skin belt	75
Rattlesnake skin bag used to hang from belt	1 25
Pearl Shell Napkin ring	20
Palmetto Fan made from Natural Palmetto leaves	25
Carved Bone pen holders and paper knives combined	15

Shells! Shells!! Shells!!!

Large Cameo	20
Spider Shell	15
Pink Murex	20
Harp Shell	25
Cockle Shell	15
Marlinspike	15
Tent Olive, fine	1 00
Marbled Cone	15
Angels Wings, fine pairs	50
Black Murex	30
Tulip Shell	15
Kid Conch	08
Black mouth Snail	10
Banded Snail	10
Scorpion Shell	15
Parula Shell	08
Large Bleeding tooth	05
Pearl Trochus	10
White Murex	15
Turk's Cap	18
Trumpet Shell	75
Snipe-billed Murex	20
Angel Shell	10

MARINE CURIOS.

Atlantic Starfish 4 in	$ 14
California Starfish	21
Black Bahama Starfish	21
Mammoth Bahama Starfish	48
Brittle Starfish	19
Sea Horse, very fine	18
Sawfish saw, 10 in. perfect	21
Devil fish Egg	.09
Skates Egg	08
Hammer head sharks egg	14
Nurse shark egg	36
Sand dollar	07
Hermit crab in shell	19
Key-hole Urchin	23
Sea Biscuit	23
Sea Fan	12
Club-spined Urchin	19
Acorn Barnacle	09
Mammoth Cala. Urchin	20
Spined Urchin, Atlantic	19
Large Tarpon scales	09
Florida Sea Urchin, small	06
Pink Coral, large spray	11
Branch Coral	18
Rose Coral	09
Honey comb Coral	18
Venus Coral	99
Porcupine fish	57

Land Curios.

Mounted Horned toad in box	69
" Tarantula " "	43
" Alligator, 11 in	75
" Scorpion in box	35
" Centipede	45

All goods sent prepaid on receipt of price.

KIRKE B. MATHES, St. Augustine, Florida.

Natural Science News.

VOL. I ALBION, N. Y., MARCH 16, 1895. No. 7

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

The Fishes of Florida.

It is not the intention of the writer to give a complete catalog of the fishes of Florida, for that would occupy too much space. Neither would a strictly scientific history be of interest to most of your readers; but it has been thought best to speak of the many fishes in a general way, and refer to those of special interest, both as natural curiosities, and of peculiar habits, as well as those in favor as table delicacies, and with anglers.

Among the voracious fishes on the coast, none are better known than the sharks, and wherever one goes in the neighborhood of salt water, in the numerous lagoons, and even in the mouths of rivers, these savage fellows are found in abundance. At one place where a party of us were stopping, they set the gill-net in the lagoon twice or three times a week, for the mullet, channel bass, sheephead and othe. food fish to supply our hotel table, and without an exception, when the net was hauled in the early morning, there were from two to a dozen sharks entangled in the meshes.

Those caught in the net were always small, generally from three to four feet long. The only reason we did not secure the larger ones was because they were stronger and would free themselves by tearing through. The net was a sight to behold when it was drawn, and the guests at the hotel used to turn out of bed at an early hour to see the haul made. There were sharks, sawfish and a dozen other lesser kinds in quantities. It was not uncommon to secure several hundred pounds at a time, and again only fifty pounds, or so, would come in, but the little sharks and sawfish were always there; and they were always ugly and flopping about. The nets were often torn to pieces, in parts, and it kept one man busy mending the rents where big saws or sharks passed through.

We did not meet with a shark over six feet long and as far as I could see the big stories are all nonsense. Sharks of this kind, the Shovel-nose, also called Sand shark, *Carcharius americana* (Mitch.) J. and G. are great cowards and I do not believe one of them ever attacked a man; but of course fish-lies are very common.

We often cast out set lines, and left them over night, and the first person up in the morning pulled in the prize. Sometimes we got a bass, sea-trout or what not. One day, a little girl of nine years, found a big fish on the line; but nothing daunted she placed the stout line over her shoulder and walked away, and out came Mr. Shark, and was hauled up on the beach floundering and flopping. This fellow was over four feet long with a mouth full of sharp teeth.

To a novice the landing of a good sized shark is quite an adventure, but to the scientific angler, nothing is considered a greater nuisance than to have a shark take the bait when the angler is trying for other fish. It is a trick to save your tackle when you strike a five foot shark, and many a northern tourist has smashed his $25.00 to $50.00 split bamboo rod on a shark, finding that he had more than he bargained for.

Sharks are no good on earth, any more than in the sea, and when captured are used for fertilizers only. They smell and are unfit for food. Thousands are caught yearly yet they are as common as ever. This species, the Shovel-nose, is found all up and down the Atlantic coast of our country, and, as well in the Gulf.

One other species. the Bonnet-headed shark was also met with. Only small specimens were seen. An idea of the shape of its head may be taken from its scientific name, *reniceps*, which means kidney-head. It is nearly allied to the equally oddly shaped Hammer-head.

The Remora, from its relation to the Sand shark, demands a place here. This species, *Echeneis remora* L. was often found sticking, sucking to the sides or underparts of the larger sharks. I know of three specimens being taken from one shark, but often there were two or only one. They are generally from 12 to 18 inches long and of trim build, and have a sucker apparatus on the top of the head. With this they secure their hold and retain it when wishing for free transportation. I have often seen them loosen their hold, swim about, following the movements of the larger fish, and then re-attach themselves. Sometimes the Remora sticks to the back of its selected "free bus," and then it is, of course, upside-down, but this does not seem to bother it, and, in truth, with its queer shaped head and fins, it looks more natural in this position. It gains a living while riding about and the shark does not seem to object to its presence. This parasite is also known as the Pilot fish.

Saw of Saw-fish, *Pristis pectinatus*, LATHAM.

The Saw-fish, *Pristes pectinatus*, nearly allied to the sharks, is very interesting and commands the attention of naturalists, as well as of those persons who simply look at a "critter, cuz it's curos." I wish there was space to describe the process of breathing in saws, sharks, skates, etc., for it is a most interesting subject. Many of my readers may know that sharks, and the like, are not true fishes.

The saw or nose projection is a remarkable appendage, and a good day's study may be devoted to its peculiar structure. With this weapon of nature's supply, the Saw-fish secures its prey, which consists of fishes, according to some authorities. It is said to rush into a school of smaller fishes and strike about with its curved snout and disable and feed on the victims. Dissection shows that this fish also feeds on mollusks and crustaceans found at the bottom of lagoons.

Ordinarily the Saw-fishes which we captured in nets, were from two to five feet in length, but at one time two were taken, respectively 11 and 13 feet long. Saw-fish have

been taken on a rod and line, and one person captured one which was, if I remember correctly, sixteen feet long, and weighed several hundred pounds. It was the largest fish which was ever captured on light tackle in America.

Ordinarily the saw is about one-fourth the length of the fish or a little less. It follows, that when one sees a trophy of a four foot saw, that the fish must have been a monster. With the smaller fish the saws are readily cut off, as the material is like cartilage when fresh and in the smaller fish. We secured dozens of them for our friends.

At the landings, or wharves as the steamers pass up and down in Indian river, and other points on the coast, natives offer the saws for sale, and these are from 5 inches to 4 feet long. The larger saws are rarely perfect, as some of the teeth are often broken out, either by the fish, or in capture.

This species watches over its young, and I have it on fair authority, that the mother fish takes the young into her mouth and conceals them in time of danger; but I don't assert it as a fact. In truth, it seems incredible, when we listen to the narrative of one man who asserts that he took 12 young saws each two feet long from the mouth of their mother. Mayhap the story is true? but—oh! what a mouth was there.

A party of us fished up and down the Hillsboro and Halifax rivers, on the east coast with success, and at New Smyrna, at Mosquito Inlet, I met with the greatest variety of fish in the shortest space of time. But at Cedar Keys and St. Petersburg on the Gulf Coast, as well as at Jupiter Inlet and Lake Worth, great numbers, and of many species were seen.

At one resort, Mr. K—— went down to the wharf at an early hour and pulled in a 26 pound Channel Bass. It was on Sunday morning and we all pestered him because he was so sporty on the Sabbath, but he seemed very proud of his catch, and stood holding the fish until we snapped our cameras at the lucky old gentleman's good luck. These fish generally grow to a size of eight or ten pounds, but are sometimes pulled in, which weigh 50 and 60 pounds. They are reddish in color with a black spot on the tail.

The Sea-trout is a fine appearing fish, and is also known as the southern Weak-fish. It has beautifully mottled sides, and is very pleasing to the eye when first caught, but quickly loses its iridescent tints. The species at the south, many of which are charmingly colored, are almost invariably found to lose their colors soon after being drawn from the water, and like the brook trout at the north, soon fade.

The evanescence of quality is also a feature as regards the fish on the table. If you want your fish prime, you should catch them and slap into the skillet while the tails are still flopping. And there is a charm about this kind of sport and cookery, with the accompanying zest from an open air appetite, which makes cruising about in a yacht highly desirable. Sea Trout are excellent if cooked when first caught, and like many other southern fish, as well as with northern species, are very poor if stale.

I caught many Sea Trout and they are fair sport, whether by still-fishing or troll. Some trout were as heavy as eight pounds, but most of them went from three to five.

In a short time after putting up at a hotel a person of active disposition desires a change and to see the country and to go among the birds and fishes.

Spring Butterflies.

The earliest spring butterflies are those which have hibernated. They may be seen about the first of March or even earlier if the weather is mild. The most common hibernating species are the Camberwell Beauty *Vanessa antiopa* and the common butterfly (*Grapta comma*). Numbers of them gather in vicinities where the sap runs from the trees in early spring, and as many as a dozen may be counted on a maple or birch, sipping the sweet sap. There are two butterflies rarely found in this locality which I took early in April last spring; *Grapta J-album* and *Vanessa Milberti*. They had passed the winter in some sheltered nook, as their wings were somewhat torn and soiled. The Red Admiral *Pyrameis atalanta* and the Thistle Butterfly *Pyrameis cardui* also hibernate, but they are rather rare in the spring.

The first butterflies to appear in their fresh bright colors are the little blues *Lycæna pseudargiolus* and the common CabbageButterfly *Pieris rapæ*. These appear about the middle of April or shortly after the first of the month. *Papilio ajax* makes its appearance very early, frequently in March, but it is very rare in this locality. *Papilio turnis* also appears early.

By the last of April or the first of May a dozen or more new species appear, and before summer has really set in, many of the early spring forms have disappeared.

John Bright,
Pittsburg, Pa.

Vultures.

Having read with much interest and profit "Florida Cruising" by Eugene Pericles, in the Natural Science News of Feb. 9 and as my life has been among the southern birds, I now venture some information concerning our two most common Vultures,—*Cathartes aura* and *Cathartes atrata*. These birds are very tame frequently alighting in the streets, and they are protected by law, a fine being imposed for their destruction.

As I have always seen these Vultures (or Buzzards as they are called here) sailing high or low and in every attitude I think I could venture some information concerning the association of these birds together. In every flock might be seen both, though the Black exceeds the Turkey about three to one. They *do* associate, feed and fly together. I am certain of this having seen both in a dead oak Feb. 22, 1895.

I enjoy the Natural Science News very much. So does my father who is a College Professor of Material Science.

Clarence L. McCartha,
Troy, Ala.

Asbestos.

Up to the late '70s nearly all the asbestos used came from the Italian Alps and from Syria, but one day a party of explorers discovered a rich deposit in what is known as the eastern townships of Quebec in Canada. Companies were at once formed and in 1879 the mines were opened. Remarkable as it may seem, however, although the Canadians started factories, in the operation of which they were substantially backed by English capital, it was an American concern, with headquarters in New York, that developed the manufacturing industry most rapidly. The company has now grown so large that it has branches in nearly all the large cities of the country, and the machinery used is specially made and peculiarly adapted to the manufacture of asbestos articles. There are also a number of large factories in England.

The Canadian mines are located in a wild, rough country almost outside of the pale of civilization. The hills have worn themselves bare of earth, and the bleak rocks glare out in great bald patches. At one time a scraggy growth of pines clung to the remaining ridges of soil, but forest fires, the hand of man and the ravages of wind and weather have left only the dreary waste of burned and blackened stubs. The sides of the hills gape with great holes in which the men —mostly French Canadians—are at work. The veins of chrysotile, as the Canadian asbestos is called, are from two to four inches in thickness and are separated by thin layers of hornblende crystals. The nearer to the surface the veins run the coarser are the fibers and the less valuable.

The mining is done by means of the most improved quarrying machinery. Holes are drilled in long rows into the sides of the cliffs by means of steam drills. They are then loaded with dynamite and exploded simultanously by wires connecting with an electric battery in such a way that a whole ledge of the rock falls into the bottom of the pit at once. Then the workmen break out as much of the pure asbestos as possible, load it into great tubs or trucks, which are hoisted out by means of steam derricks, ond run along to the "cob house." Here scores of boys are kept busily employed crumbling or "cobbing" the pieces of rock away from the asbestos and throwing the lumps of goodfiber to one side, where it is placed in rough bales or sacks ready for shipment to the factory.

The greatest work in connection with the mining of asbestos is in disposing of the waste rock and the refuse of the quarry. Only about one-twenty-fifth of the material quarried is real asbestos and the rocky parts have to be lifted out and carried to the dumps at great expense.

As the asbestos comes from the mines it is in small lumps of a greenish or yellowish hue and the edges are furred with loose fibers. The more nearly white the asbestos is the better its grade. The length of fiber is also of great importance, the longest being the most valuable.

As if in keeping with the forlorn and blasted appearance of the country, the miners are a hard, uncanny class of men, migratory in disposition and exceedingly superstitious. Their wages range from $1 to $1.50 a day.—*Chicago Record.*

Turkey and Black Vultures.

In his article in No. 2 of the NEWS Mr. Eugene Pericles asks for authentic notes on the Turkey and Black Vultures. He stated in his article that the Black Vulture lived in colonies, and when they took possession of a locality they expelled all Turkey Vultures and kept them away. This is certainly not the state of affairs in Texas. In many localities I have observed both species in large numbers and both are common over a large part if not all of Texas.

Both have been seen in considerable numbers at San Marcas, Velasco, Corpus Christi, Galveston, Giddings and many other localities.

In inland localities the Turkey Vultures are generally more numerous, and on the Gulf coast the Black are more numerous.

'Twas only last week that I saw two Black and three Turkey Vultures feasting in apparent harmony on the remains of an unfortunate calf.

The Black Vulture seems to prefer the coast to the interior and this may account for their being more numerous in certain localities in Mr. P's neighborhood than in others.

I have never noticed any racial war between these two species, though I have been familiar with both for many years and have seen them many times feeding together.

JAMES W. BROWN,
Giddings, Tex.

To All Michigan Observers.

In December last, the 'Michigan Academy of Sciences' was instituted at Lansing, with eighty-six charter members. Departments were formed, and a sub-section of ornithology for the advancement of study among our birds was organized.

The honor of chief of the sub-section of ornithology, was conferred upon me, as a centre of communication for observers in the state, and it is hoped and expected, that by our combined efforts, we shall gather much valuable information and which will be published in the transactions of the Academy.

There are many observers in Michigan who have not yet joined our ranks, and to these, an invitation is extended, as all lovers of the sciences are welcome. Others, who are extralimitory in their residence, are also eligible; those living just over the border in adjacent states, or the Dominion, are especially desired for our work.

The initiation fee of $1.00, and annual dues of $1.00, may be sent, together with application for membership to Prof. E. A. Strong, Ypsilanti, Mich.

Our State possesses such a large number of observers, that personal letters would involve much labor, and it has been thought best to issue this communication. All observers, whether members of the 'M. A. S.' or not, who are willing to undertake observations, will please to communicate with—

Yours Respectfully,
MORRIS GIBBS,
Kalamazoo, Mich.

The Spreading Adder; Hog-nosed Snake.

Heterodon platyrhinus.

Prof. E. D. Cope informs us that these snakes do not attempt to bite from the ground, and this is no doubt correct regarding the most of them, but there are exceptions to this rule, for when a small boy I received a bite in the foot from one of them which caused such a severe sore that I shared for a long time the prevailing belief that these reptiles were venomous. It is certain, however, that their long posterior maxillary teeth are not grooved, and are not connected with any source of poison. I have been bitten by them on several occasions when handling them carelessly, and find that their bite resembles a series of punctures made with a very fine needle, and is no more serious in its effects. Still it is easy to understand how their recurved teeth on being forcibly pulled through the skin of a little boy's foot would leave a scratch that might possibly result in a sore, just as any other abrasion of the skin might.

The pairing of the *H. platyrhinus* has been repeatedly observed. The intromittent organs, (hemipenis) are oval in form, an inch long and over half an inch thick. When the male organ has been inserted into the oviduct it cannot be withdrawn until invagination has taken place, for the hemipenis is set with strong horny spines, projecting backwards and having almost the appearance of the claws

of a cat. The spines take firm hold on the walls of oviduct, and if forcibly withdrawn would cause lacerations, or might result in the hemipenis being torn off at its base. So spiny are these organs that the snakes are said to project them and use them as defensive weapons. This would seem highly improbable, but Prof. Cope tells us of two that were caught by a cat, and projected their organs and fought their captor with them. It is certain, however, that the snakes are very careful not to present these organs evaginated far enough to expose the delicate structures near the apex.

I have heard boys assert that these snakes possessed rudimentary legs, and that they would protrude them on being thrown upon a fire. We may find a probable explanation of this supposed phenomenon in Prof. Cope's statement that the snakes may be compelled to project their hemipenis by holding them before a fire, though the Professor adds that he has not seen this himself.

The breeding habits of this snake are not fully understood though something is known of them. There is considerable variation in the dates on which they have been seen pairing. Prof. U. O. Cox reports May, Mr. H. A. Townsley April 17th, Prof. W. S. Blatchley April 19th, Mr. E. R. Quick late in June, and I have observed them about the middle of April.

The period of gestation and the length of time required for the eggs to hatch are not known. Dr. C. C. Abbot says that he has frequently found their eggs, in considerable numbers, a few inches below the surface of the ground in May. I have observed the newly hatched young about September first, and it is certain that they are usually hatched rather late in the season. It is not probable that the eggs remain in the ground from May until September before hatching, but it is quite possible that some of the late pairing individuals may bear their eggs over the winter and lay them in the spring.

It is certain that these serpents are very prolific, though observers vary greatly in their accounts of the numbers of the eggs and young. Dr. Gerard Troost dissected a specimen and found in her 25 eggs. Dr. O. P. Hoy tells of a nest containing 27 eggs that was brought to the National Museum Aug. 31st. The female was near the nest when it was taken and tried to defend it. These eggs hatched Sept. 7th and 8th. Prof. F. W. Cragin, in *American Naturalist*, says that he found 22 eggs of this snake that had been plowed up in a sandy field along Long Island Sound. I have at different times found three nests, all buried a few inches deep in sandy ground, and containing between twenty and thirty eggs each. It may be assumed tnat the usual number of young ranges between twenty and thirty.

Many writers, however, credit this species with a fecundity that is simply marvelous. One contributor to the *American Naturalist* tells of over one hundred young snakes issuing from a wound in the side of a female *Heterodon*. Another, Dr. J. Schneck, reports eighty-seven young taken in the same way. Still another, Dr. Bumpus, states that a female in the National Museum brought forth one hundred and eleven young. It is but just to these writers, however, to state that they admit that they did not see the large numbers themselves, but got their information from others who did.

The eggs are oval or elliptical in shape, covered with a thick, tough, yellowish white membrane, containing little or no calcareous deposit. Besides this outer coat there is a lining of thin delicate membrane. They measure from an inch and a quarter to an inch and a half in length, and about seven-eighths of an inch in shorter diameter.

As some insects have a special pair of mandibles used for no other purpose but to cut their way out of their cocoons, and young chickens have beaks hardened at the tip for breaking open the shell, so the unhatched *Heterodon* has an egg tooth with which he opens the leathery covering which encloses him. This tooth projects forward, is turned slightly upward, and is squared off at the tip. It has a ligamentous attachment by which it may be raised a little but not depressed. The tooth is pressed against the egg covering, and being pushed forward makes an opening, not tearing the membrane but cutting it, leaving the edges of the aperture perfectly smooth. The egg tooth, having served its purpose becomes loose and drops out within twenty-four hours.

Strange to say almost the first thing the young snake does on issuing from the egg is to shed its skin, rubbing its head against any convenient object until the exfoliated epithelium becomes loosened about the lips, and then squirming about among sticks and clods until it is entirely drawn off.

Even the very young display all the characteristics of the adults, flattening and raising their heads, hissing threateningly and attempting to strike. Some of them will also appear to feign death, though the young, like the adults possess this trait, or disease, in a varying degree. Prof. O. P. Hoy experimented with 15 young and "succeeded in getting only two or three to go through with this performance, but these did it to perfection. The others of the young would not act in this way, however much they were teased."

Dr. G. Brown Goode says that it is a matter of common belief that the young snakes go to their mother for protection, and that she affords them a hiding place in her stomach. My observations, however, lead me to believe that the young snake finds a hiding place in its mother's stomach only when she is pressed for food. I have never seen these snakes pay any attention to their young when other food was obtainable, but I am certain that they will eat their own species when no other food is to be had.

They are given to burrowing in search of food, and can turn up loose ground with their enlarged tribedral rostrals almost as effectively as a rooting pig. Mr. H. A. Townsley kept a number of them in captivity, and tried in vain to raise a sod in his terrarium, but the snakes killed the grass by persistently rooting it up. They were voracious, and he has seen three of them holding on to the same toad and engaged in vigorous pulling. Although their usual habitat is dry sandy ground, Mr. Townsley's snakes appeared to enjoy an occasional bath, and they would even crawl under a stream of water when he was filling their tub, or sprinkling the grass in his terrarium. I can find no account of their voluntarily entering the water when at liberty, but when I placed two of them on a sandbank in a creek they promptly took to the water, inflating their lungs to an incredible extent, and swimming with very awkward motions.

The *Heterodon* is an interesting subject to study, but as its food consists mainly of insect eating toads and frogs it can scarcely be regarded as a friend of man.

Angus Gaines,
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Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	7:50
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
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Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
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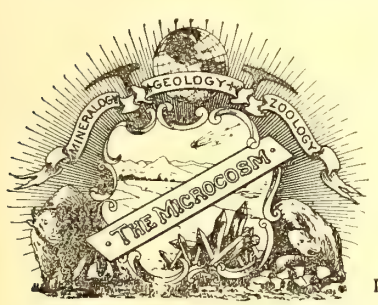

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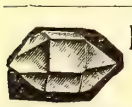

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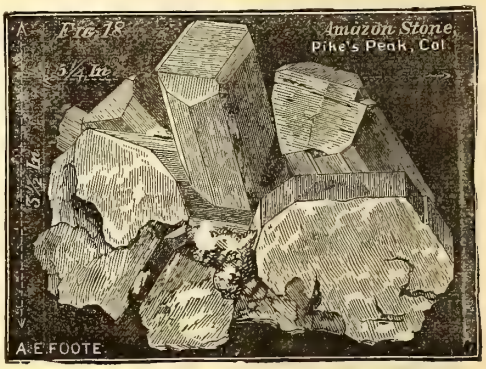
My Catalogue of Minerals and Mineralogical Books, 128 pages, is sent free to all intending purchasers who request it on headed paper and to all customers, to others postpaid on receipt of 5 cents, heavy paper 10 cents, bound in cloth 25 cents. (Price-list alone free, or heavy paper 5 cts). It is profusely illustrated and the printer and engraver charged me about $1,200 before a copy was struck off. By means of the table of species and accompanying tables, most species may be verified. The price list is an excellent check list, containing the names of all the species to 1892, and the more common varieties, arranged alphabetically, and preceded by the species number. The species number indicates the place of any mineral in the the table of species, where will be found the species name, streak or lustre, cleavage or fracture, hardness, specific gravity, fusibility and crystallization.



Collections of Minerals for Students, Amateurs, Professors, Chemists, Physicians et al.

The collection of 100 illustrates the principal species and all the grand subdivisions in Dana's and other Mineralogies: all the principal Ores, &c. &c. The first hundred includes *every species* in the list advised in Dana's Manual, and some species like Wulfenite, Vivianite, Labradorite, Datolite, Titanite, that are especially advised by Brush, Nason, Egleston or other writers on Mineralogy and blowpipe analysis; also other species like Turquois, Azurite, Microline and Wavellite that are important. The second hundred includes the remaining varieties advised by Dana, and most species advised in text-books on Mineralogy and blowpipe work.

Our third hundred includes more rare species and varieties. The 300 include 240 species, nearly all mentioned in large type in Dana's and other text-books on Mineralogy and blowpipe analysis, and a few recent species of much importance not mentioned in them. The collections are labeled with printed labels that can only be removed by soaking. The labels of the Student's and higher priced collections give Dana's species number, the name, locality, and in most cases, the composition of the Minerals; all the collections are also accompanied by my illustrated Catalogue and table of species. The sizes given are average: some smaller, many larger. Series up to about 1500 species and varieties are furnished.

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Crystals and fragments, ¾ in	$ 50	$1 00	$2 00	$1 00	$2 00	$4 00
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Amateur's size, 2¾x2 in	.....	.....	.....	10 00	20 00	45 00
High School or Academy size, 2½x3½ in., Shelf Specimens	.....	.....	.....	25 00	50 00	125 00
College size, 3½x6 in., Shelf Specimens	.....	.....	.....	50 00	100 00	250 00

No references are given because there are but few institutions in America that have not purchased of me and but few countries where I have no customers.

Many of the scientific men of the country recognizing the advantage of having such an exchange, have placed copies of their papers in my hands for sale on commission. Our lists of scientific books are sent free on light paper, except the 200 page Medical Catalogue, same price as the Mineral Catalogue. Heavy paper, see page of book abbreviations.

All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

When any book inquired for comes to hand, a memorandum, stating description and price will be sent. In our book catalogues the prices opposite the latest number supersede former prices usually where descriptions are the same. My arrangements for noting the needs of my correspondents are nearly perfect.

Over 300,000 pamphlets and papers, many uncatalogued, in stock. I will get what you order ultimately.

FINALLY AND OF THE MOST IMPORTANCE.—We must especially request our customers to let us know of all mistakes and errors that may occur at our establishment. We can and will gladly rectify them at our own expense.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J. W. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Broken Bank Bills.

I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c.

J. E. HANDSHAW, Smithtown Branch, N. Y.

Natural Science News.

VOL. I. No. 8. ALBION, N. Y., MARCH 23, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

NOTICE.—Anyone wanting first-class sets from this locality the coming season will do well to write to me for lists and prices. E. L. HALEY, Phillips, Maine.

EXCHANGE.—A1 skins of Oregon birds. Desire in return bird skins, eggs, camera, printing outfit, microscope, guns, natural history books, etc. Eggs collected to order the coming season for exchange. Correspondence solicited. ALBERT G. PRILL, M. D., Sodaville, Linn Co., Oregon.

FOR EXCHANGE.—A beautiful skull with a full head of hair and skeleton of a woman, found in a mound in Southern Ohio, one of the greatest wonders ever offered—for Indian relics and stuffed birds, best offer. Adderss J. W. MYKRANTZ, Ashland, Ohio.

FOR SALE.—Navajo blankets, Mexican opals and other curios. Write for prices. CLIFF HALE, Phœnix, Arizona.

FOR SALE.—A good dynamo 6x5x2½ inches, new, cost $6. Sell it for $3 at purchaser's expense. All letters answered. CHAS. STURM, Ashbourne, Pa.

FOR SALE.—A $20 violin outfit, almost perfect condition. Will sell for $14 or exchange in part payment for Ithaca gun. A. D. DU BOIS, 702 E. University Ave., Champaign, Ill.

WHAT CAN you offer for three live young Great Horned Owls, fine specimens, suitable for pets. Want cash, climbers, eggs in sets. All letters answered. CRAFTON & ESSIG, Plattsburg, Mo.

WANTED.—Insect cases for which I will make a liberal offer in eggs, insects, minerals, fossils, woods, etc. Write at once to E. DWIGHT SANDERSON, 503 Hollister Blk., Lansing, Mich.

TO EXCHANGE.—32 Winchester repeater '92 model, *new*, 50 bird skins, 35 books travel, explorations, etc. Mounted birds and sets. Correspondence invited. No postals answered. STEPHEN VAN RENSSELAER, JR., 39 Broadway, New York.

TO ANYONE sending me a common set of eggs I will mail them 100 Columbian stamps and 20 rare U. S. stamps, all different. B. CUDLIP, JR., 2006 8 St., N. W., Washington, D. C.

EXCHANGE.—1 set boxing-gloves, 1 pair roller skates, 500 foreign stamps (mixed) crystals, tufas, live birds, insects, natural history specimens, 1 world almanac (new) for scientific books and Tribune almanac. Want lists exchanged. Stamps exchanged. ELBERT T. BELDEN, Hot Springs, Ark.

TO EXCHANGE.—Miniature Incandescent light; one-inch Beck eye-piece; two-storied nest of Yellow Warbler, nest of White-eyed Vireo, naturalists' papers for Ornithological and Mammalogical books. CHAS. F. SWAN, Box 3, Abingdon, Ill.

FOR SALE to highest bidder a 7¼x13¼ Excelsior press, cost $44; 25 lbs. 10 point Roman type; and several fonts job type. *All good as new.* Proofs of type for stamp. W. A. JOHNSON, Galesburg, Ill.

WILL EXCHANGE 4-keyed flute in good condition with instruction book, cost $4.50, for $2.00 in U. S. fractional currency or $1.00 in rare issues. First answer gets it. E. H. SHORT, Gaines, Orleans Co., N. Y.

CLOSE OUT.—Offer collections war relics, Indian curios, marine specimens, alcoholic specimens, shells, corals, fossils, Confederate money, reward bills, papers containing rewards, Columbian stamps and others for bookcase and bound books and magazines. Send lists. EUGENE SHUGART, Box 71 Harpers Ferry, W. Va.

FOR SALE.—Any person wanting an extra fine pair of climbers will receive the same by sending 80 cents to R. C. ALEXANDER, Plymouth, Mich.

TO EXCHANGE.—Mounted birds such as Snowy Owl, G. H. Owl, Bald Eagle, Pelican, Peacock, etc., for a good hammerless shotgun 12 gauge, Parker preferred. H. M. WOLF, Kewanee, Ill.

FOR SALE.—Data blanks "two styles" at twenty cents per hundred. Please send postal for samples. R. E. CASE, Avon, Conn.

PRIME SPECIMENS of birds and mammals, either land or water, in the meat or fresh skins to exchange for arrowheads, spears, etc. Send your list and receive mine. RILEY P. BROWN, Collector and Taxidermist, Milton, Wis.

TO EXCHANGE.—A good orchestra drum, almost new, value $15, for a camera or cash. JOS. N. PATTISON, Oak Lane, Station A, Philadelphia, Pa.

FOR EXCHANGE.—Camera 4x5 tripod, two rubber trays and printing frame, fair condition, value $2.00, for bird skins, minerals or curiosities, etc. RICHARD McMURTRIE, East Coulter St., Germantown, Phila. 8w2

CORRESPONDENTS.—Those desiring to exchange the coming season in Ornithology, Conchology, Entomology, Mineralogy, and Geology of Minnesota will do well to communicate with GEO. C. FUTROYE, 569 Marshall Ave., St. Paul, Minn.

COLLECTORS.—I will send two recipes for tanning skins with the fur on for only 20 cents silver or money order. FREDERICK HILL, Lyme, Conn.

WANT SKINS of 393, 394a, 395, 396, 400, 402, 405, 406, 409, 410, 452, 475, 476. Offer California skins in exchange. PHIL K. GILMAN, 170 9th St., Oakland, Cal.

WANTED.—Correspondence with collectors (amateurs preferred) upon subjects of interest to the student of Ornithology and Oology. ARTHUR W. KIRKPATRICK, 212 Ashmont St., Dorchester, Mass.

EXCHANGE.—Collecting gun, detachable barrel and stock; brass shells and loading tools complete. Want Davie's "Nests and Eggs," Ingersoll's "Bird Nesting" and eggs in sets. J. GORDON CRAWFORD, Dalby, Va.

TO EXCHANGE.—Bohemian Waxwing and Snowflake, a few choice skins. Want offers in Southern and Western skins. Send lists. Address FRANK HARRIS, LaCrescent, Houston Co., Minn.

FOR SALE.—A $5 Colt's single action 32 center fire revolver finely engraved with pearl handle or will exchange for good U. S. stamps. All letters answered. GEO. C. FUTROYE, 569 Marshall Ave., St. Paul, Minn.

BICYCLE WANTED.—Will give good exchange in mounted birds, Game Heads, Skins, Mats, etc. Will exchange skins for sets with data. JOHN CLAYTON, Lincoln, Maine

EXCHANGE.—Well crystallized microscopic minerals and one year of *Great Divide* for Lepidoptera and birds eggs (singles). E. A. SCHUMAN N. 7000 Tulip St., Tacony, Philadelphia, Pa.

EXCHANGE.—1 Goodel combined lathe and saw. Wanted a 3 candle-power Incandescent lamp. What am I offered? Lathe in A1 condition with tools, cost $13. C. E. CUMMINGS, 560 Auburn Ave., Buffalo, N. Y.

FOR EVERY 2 perfect arrowheads or every cent made before 1859 will give 30 varieties of stamps. SEWARD HOSP, 714 Orville Ave., Kansas City, Kansas.

WILL EXCHANGE the following sets with data, all 1st class: A.O.U. 511b, 2-4; 406, 1-4; 444, 1-3; 456, 1-4; 529, 2-4; 622a, 1-7; 619, 1-3; 674, 1-2; 333, 1-4; 339, 1-3; 360, 1-5; 598, 1-4; 704, 1-4; 687, ½ with Cowbird; 759b, 1-2 with Cowbird; at one-fourth rates for U. S. fractional currency, (shinplasters.) E. H. SHORT, Gaines, Orleans Co., N. Y.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

FOR EXCHANGE.—Single barrel, unused, Shattuck gun, 25 brass shells and loading tools complete, for best offer of rare eggs in sets. Raptores preferred. *Especial desiderata* A. O. U. Nos. 131 and 327. THOMAS H. JACKSON, 343 E. Biddle St., West Chester, Pa. 5w4

MINERALS.—25 nice specimens by mail, 35c. W. S. BEADLES, 814 W. Marshall St., Richmond, Va. 7w30

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft. width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N. Y. tf

TO EXCHANGE — One splendid mounted young deer head, with the velvet on the horns. I would like to exchange for Black Bear skin for rug. Must be nice. WILLIAM RADDER, Attica, N. Y. 7w2

FOR EXCHANGE.—Garnets, rough and polished opals, for ores, petrified wood, polished agates, crystals, skins, stamps or cash. ROBERT BURNHAM, Dennis, Mass. 7w2

FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp, D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

INDIAN Relics of great value for sale or exchange. Addresses of collectors wanted. Interesting collection postpaid for 24c in stamps. THE ARCHÆOLOGIST, Box 502, Columbus, Ohio. 3-w4

WANTED.—Catalogues of all dealers in poultry and supplies; also addresses of all teachers in tax. State prices. J.A. MUENCH, 6743 State St., Chicago, Ills. 7w2

CASH paid for books on N. American or Ohio birds. A new water blower, eggs and old coins, for climbers, etc. EMMET D. AUSTIN, Randolph, Portage Co., Ohio. 7w2

WANTED.—Shells in exchange for moss and cacti. MARY HERHOLD, Box 92, Sheridan, Montana. 7w2

TO EXCHANGE.—Butterflies of Western Pennsylvania, for butterflies of U. S. not in my collection. I would prefer unset specimens. JOHN BRIGHT, Roup St., Pittsburg, Pa. 7w2

WANTED.—Any species of American birds, either skins or sets of eggs, in exchange for British sets. Only a few species left. All must be first class. FRANK HARRIS, La Crescent, Houston Co., Minn.

ORNITHOLOGY and OOLOGY.—I want to obtain a quantity of back numbers of various publications relating to BIRDS and will allow prices as follows for the same. Will accept any number of copies not to exceed 10 of the same issue. All must be *complete* and *clean*. "Bulletin of the Nuttall Ornithological Club" and "The Auk" 30 cts. per copy. "The OOLOGIST" (published at Utica, N. Y. and Rockville, Conn., 1875-81); the "Ornithologist and Oologist;" and "The Nidiologist;" "Random Notes on Natural History" Prov., R. I. 5c per copy. "Wisconsin Naturalist;" "The Taxidermist;" I will allow 3 cts. per copy. I will allow the above amounts in payment for, specimens, instruments, supplies or publications or if you prefer will send credit check for the amount. All publications must be sent *prepaid* (you can mail them as "second class mail matter" @ 4c per lb.). "Returns" will be sent prepaid unless otherwise specified in catalogue. I can also use the following second-hand books on same conditions at prices quoted *prepaid*. Must be in A No. 1 condition. Coues' "Key to N. A. Birds" $4.50; Ridgeway's "Manual of N. A. Birds" $3.75; Davie's "Nests and Eggs of N. A. Birds, 3d or 4th; editions, cloth, 85 cts, paper 65 cts; other *standard* publication will be accepted at one-half publishers prices. This notice will remain in force until April 15, 1895. After that date write what you have to offer before sending. FRANK H. LATTIN, Albion, N. Y.

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Data Blanks per 100	15, 20 and 25c
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of 52 specimens all named, such as usually sell for 5 and 10c each, we will send prepaid for ONLY $1.00.

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Send 25 or 50 cents for a collection of Shells, Photographs and Curios. Address,

D. S. EBERSOLD, Oceanus, Brevard Co., Fla.

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Artistic, Durable, Satisfactory!

Do you want to learn to mount birds in a lifelike and satisfactory manner?

Do you want a reliable method, and at a very reasonable figure?

Do you want a process of mounting which you can learn, in one lesson?

Then write for my process of Embalming, which is sure to please you.

The method, is embalming the body almost entire, and the resulting adjustment of the wings, head and legs is more satisfactory, and gives better results than from any other process in modern taxidermy, and is far superior to all other methods in this respect, because so easily understood.

If you are a first-class taxidermist, you do not need this method, for you have already spent years in learning the trade: however, you could learn a valuable lesson in the art of posing of a bird, for this method is superior to all others in this respect.

But it is to the beginners that my process appeals.

There are thousands of boys and girls, as well as grown persons, who wish to mount specimens, yet who have no means of learning.

It costs from **ten to fifty dollars** to take a course of instruction from a competent teacher, in the art of taxidermy, and at those figures, the best points are not learned.

It takes from **$5.00** to **$10.00** to buy a good work on Taxidermy, and it is a well known fact that without assistance, few, very few, succeed.

If you purchase, this process, it will cost you **75 Cents** for one pound of the Compound, and the printed instructions.

One pound of the Embalming powder will fully prepare and preserve 40 to 50 small birds, and it is guaranteed to keep 20 birds the size of a robin, forever.

TESTIMONIALS.

Testimonials from boys are to be expected and I have hundreds of them; but I, also have over (200) letters of commendation from leading professional men, doctors, ministers, professors of first-class colleges, and even regular taxidermists have advocated and extolled my process; while parents, of children who were too young to write, have told of the success of this method, and which they have taught to their children.

A Few Testimonials.

Have found your process a success. Birds that I mounted look well. Am satisfied.
F. A. NORTON, Normal School, Ypsilanti, Mich.

Your process works well. I am thoroughly satisfied.
L. B. HARTZELL, Crystal Springs, Kas.

The instructions and embalming compound received. My son is making rapid progress for one so young. Is filling the house with mounted birds. D. F. STUCK, M. D.

DEAR SIR:-The process is a great success and gives me much pleasure. My little girl can mount birds in a life like manner after two weeks' practice, much to her delight. She is eleven years old. My boy of fourteen succeeded at the first attempt. Your method of shaping the body and wings is superior to all others. MRS. H. B. JOHNSON.

Swindles!

Counterfeits!!

Imitations!!!

There are many imitations of this process and they are all advertised as **just as good**!

The truth is, they are worthless productions; the preparations being composed of inert incredients put up by irresponsible persons, while the directions are invariably merely garbled copies of my instructions.

The ingredients of my compound cost heavily, even at wholesale, but by purchasing largely, and by a superior process of mixing these poisons, there is a small profit if many orders are taken.

"$100.00 Reward!"

Many are unbelievers as to the efficacy of this compound, as they think it cannot preserve flesh.

One Hundred Dollars Reward

Will be paid to the person proving that one ounce of the compound will not preserve one-half pound of beefsteak, porksteak, mutton or fowl, forever. The meat can be hung in the sun immediately after it is prepared, and will never be infested with fly blows.

Will Meat Shrink?

Certainly it will! But by a method which is fully explained in the instructions, this shrinkage is easily, and fully compensated for in a simple manner, and the specimens require less attention than specimens mounted in other ways.

Specimens which I mounted by this method over twenty years ago, look well today and hold their freshness and shape much better than with birds mounted in traditional style (stuffed).

Questions answered fully if letters contain stamps.

Price of Instructions and one pound of Compound, enough for 20 to 40 small birds, 75 cents.

Fewer tools required than in any other method. Only a knife, file and wire required. The quickest method, and entirely satisfactory.

Mention the NATURAL SCIENCE NEWS, and address all letters to

MORRIS GIBBS, M. D.,

KALAMAZOO, MICH.

Natural Science News.

VOL. I ALBION, N. Y., MARCH 23, 1895. No. 8

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

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Uses of Asbestos.

From the Canadian mines the asbestos is taken by rail to the manufactories in the United States. Here the lumps of the substance are emptied from the sacks and fed into the hopper of a powerfully built machine not unlike an old-fashioned stone process flour mill. They are crushed through a series of rolls until the fibers are all separated into fluffy masses, when they pass out along a trough and into a separator. Here the small pieces of stone and other refuse rattle out through a sieve and the longer fibers are separated by a series of comb-like sieves into various lengths. The very short ones are taken out to the pulp-mill, where they are ground up fine for the manufacture of solid packing for steam pistons, mill-board and other commodities. The longer fibers are gathered together, carded and spun into yarn, just like cotton or wool. After that the substance may be woven into cloth in various ways. The cloth is of a dirty white color and has a soapy feeling.

The uses of asbestos are almost innumerable. Ground fine and combined with colors and oils by a secret process it makes a beautiful paint, which is said to go far toward fire-proofing the surface to which it is applied. Various kinds of roofing are also made by treating strong canvas with a combination of asbestos and felt and backing it with manilla paper. It is extensively used for roofs of factories, railroad-shops, bridges, steamboat decks and other places where there is danger of fire.

Nearly every one has seen the thick asbestos-felt coverings for steam pipes and furnaces. Asbestos cement is sometimes used for hot-blast pipes and fire-heated surfaces. As a packing for locomotive pistons, valve stems and oil-pumps it is almost indispensable. It is also made into ropes and mill-boards, which can be used almost everywhere. Asbestos cloth is being used more every year. Some states require theaters to use an asbestos drop-curtain to protect the audience if the scenery catches fire. Some very beautiful drop-curtains have been made and the ordinary spectator cannot distinguish them from real cloth.

The yarn is knit into mittens for workers in iron and glass. Goldsmiths use a block of asbestos to solder upon. Combined with rubber—vulcanized—asbestos has almost innumerable uses as an electrical insulator. In this form the substance resembles ebony, and is about as hard. The cloth is also of the greatest importance for acid-filters in all kinds of chemical processes, for the reason that no acid will eat it.

Asbestos is found in a good many hundreds of places in the world besides Italy and Canada, but the fibers are nearly all too splintery and brittle. Rich deposits have recently been found in Wyoming, California and Montana, and the United States may soon come to the front as a producer of the substance. In 1893 California produced fifty tons of asbestos valued at $2500, while Canada sent out 6,473 tons valued at $313,806. A good mine of asbestos is more valuable than a gold mine, and as the substance becomes better known and more used it will be still more precious. The time may not be far distant when firemen will be clothed in suits made from asbestos.—*Chicago Record.*

A New Style of Geode.

By L. W. Stilwell, Deadwood, S. D.

For years I have been collecting Fossils in the "Bad Lands" on the Cheyenne river in South Dakota, in close proximity to the Black Hills. Broken fragments, irregular, small, rough and large flattened convexions of chalcedony have been discovered from time to time, but not until this season have I obtained a supply of Geodes of much value.

Recently one spot in the heart of these barren, terraced and pinnacled "Bad Lands" has furnished 800 beautiful, white chalcedony Geodes. They have rather thin walls and are lined with a white, sparkling crystalization resembling frost and snow—entirely unlike the noted Keokuk Geodes. I consider this a rare find. They are about the size of hens' eggs, round or oblong and hollow, with the lining above mentioned. They appear, as they lie loosely in the Tertiary sea mud and marly soil, to have been formed in cavaties of their own shape, either in a porous bed of the old sea, or to have been made in and disintegrated from rock containing small cavities, at some unknown distance from their present place, to which they have, in such case, been carried by the flood. We find chalcedony forms filling the cracks of the sea mud now, as if moulded there, and these Geodes may have been moulded near by and in the soil where they now loosely lie. They are certainly very beautiful and interesting.

For the Atlanta World's Fair.

A party consisting of William Palmer, taxidermist, Prof. Ridgeway, Curator of the Department of Birds, and Edward J. Brown Ornithologist, were in the city last Monday. These gentlemen are connected with the National Museum and Smithsonian Institution of Washington, D.C. They left Monday afternoon down the Kissimmee river. They carried with them traps and instruments necessary in collecting and prepariug birds, snakes, insects and animals of every description, with a view of getting a collection of the fauna and flora of the south-eastern section of the United States. They will remain in this section until April, collecting anything suitable for exhibition for the National Museum on their return their collection will be put in shape for exhibition at the Atlanta Exposition in connection with the United States Departmental exhibit, after which it will be placed in the National Museum at Washington.—Kissimmee Valley, Fla.

The Shell Heaps of Florida.

The Florida Shell Heaps are the most wonderful evidences of the accumulations of years to be found on the American continent. There may be equal, or greater masses of shells on the peninsula of Jutland and adjacent territory, but it is to be doubted; while the size of individual piles is larger in our country.

These evidences of the work of the prehistoric man, have caused much speculation, and many, and various are the theories of scientists as to their formation. Some theorists have aduanced the idea that the peculiar mounds were the direct work of the sea, and have tried to prove that geologic ages have alone been responsible for their formation. These scientists are not without points in their favor; but it is thought that the large majority of observers are inclined to the belief that the mounds are the effects of the early human inhabitants of the countries where the accumulations are found.

In the old world many writers are inclined to think that the formation there, were the results of a people who existed at the time when the extinct cave bear flourished; while it is generally acknowledged that the neolithic period was coeval with the growth of these heaps. The shell heaps of Denmark, together with with formations of the Atlantic * coast of North America,

* There are shell heaps reported from the Gulf Coast of Florida but the writer has not examined them.

are known as kitchen middens, literally 'kitchen sweepings' and their European human producers, were, according to Sir John Lubback, of the later stone age, and belong to the same general race or class of the human family, as the inhabiters of the lake dwelling, of Switzerland, and the stockaded islands, or "crannogs" of the British Isles. This idea is probaly correct, as viewed by observers in our country; for the mounds were evidently made by inhabitants of the stone age, and the animal remains indicate the neolithic era. Still there are so many theories in regard to racial matters, and the classification of the earlier peoples of this continent and the old world is so varied, that no determination can be arrived at.

No part of our country is more interesting to the student than the state of Florida. This interest does not attach from the fossil remains, which are very few in many parts, and are scarce worthy of rank in comparison with some other sections of the Union. The main interest accrues from the fact that the land is largely of comparitively recent formation. Perhaps it would be more proper to say that the peninsula is of special interest to physical geographers, rather than to geologists.

The state is largely flat, and in many parts there are vast sections still in process of formation. This is a condition involving the extensive region known as the Everglades, that portion lying to the north, east and south of the little known lake Okeechobee. Yet, even on the eastern border of the vast swamp, and on a narrow strip separating the Everglades form the Atlantic, are found long piles of shells, kitchen middens. Thus giving evidence, that these formations, whether from human cause, or otherwise, long antedated any evidence of land in the interior In truth it is fair to say, that the shell heaps of the ocean coast were accumulating while yet the entire low interior or Everglades, south of the twenty-sevenfh parallel, was a huge lake. Some writers have asserted that the entire low interior was once salt water, and that the present coast was the earliest formation in the region, surrounding the water like an atoll in the formation of an island of coral foundation. This theory is not improbable, for it has been ably demonstrated that a large part of the foundation of the lower part of the peninsula is a conglomerate.

The shell heaps found on the Atlantic sea-board from Canada to Florida, and erroneously accredited to the Indians, are, so far as I am able to learn, generally found near the waters edge and if of any size, are nearly, or quite, always in a parallel line with the ocean or salt water lagoon.

Many that I examined gave evidence of great age, while some of them led me to think that a portion of the heap was at least of recent formation, and the conclusion was arrived at, that these mounds, perhaps a thousand years, or more, old, since first began, were not rarely used at later dates as burial places of the dead. These mounds, probably began centuries before the recent tribes of so-called Indians occupied the region, were finally used as sepulchres by succeeding tribes. These differences in the apparent age of the mounds agree with the various theories regarding their formation. These theories, together with observations from careful research, will be presented to the readers.

In several quarters in Florida the shell heaps are so symmetrical in form that the idea prevails that they were built by the earlier Spanish settlers for defensive or offensive purposes. The only evidence that seems at all corroborative of this theory, is a cannon ball of ten pounds, or so, which was discovered imbedded in the mass at Lake Worth. The idea of the construction of forts is in no wise tenable, and the equally preposterous belief that the natives erected the barriers for defense is not worth consideration, for there was small chance of attack by water. Moreover it would seem idle that people of that age. who were oniy armed with bows and clubs, should build fortifications.

Nevertheless, certain of these walls or ridges have forms which indicate some purpose by their builders, or perhaps, remodlers. One nearly symmetrical mound on the banks of Indian river, situated slightly north of Micco, Brevard county, is shaped much like an alligator, with a wall around the entire space; the depression in the inside of the foot, or what you may call it, being quite level and with a well at one end, as if intended for the space. This fortress or formation is known as 'Alligator Mound.'

Another theory, and probably the correct one, as it is the belief of the best anthropologists and archaeologists in America, as well as the leading thinkers of the old world, is that the aborigines of the coast have for ages gathered on the shores and held 'tribal clambakes.' Certain sections were selected in accordance with possible religious rites, perhaps, or more likely as a matter of convenience and where the oysters were thickest. And there the noble redman or, perhaps, the prehistoric mound builders, congregated seasonally, leaving the empty shells in vast heaps, and sometimes in the regulation forms, to mark the place where they had feasted.

Probably the best mounds for observation are those situated on the Indian river, Florida. This lagoon, or river, so-called, is of salt water, and is separated from the Atlantic by a narrow strip of land from forty rods to several miles wide. Next the ocean the shell heaps are worn away by the action of the big rollers which level all within reach. But on the

river, on both shores, but more numerous on the west bank, the heaps remain as evidences of man's occupancy or Nature's upheavals.

Still another theory, this too, having rational adherance; a theory, too, which accords with Dame Nature's marvelous workings and strange freaks. It is claimed that the natural elevations and subsidences of the sea shore, and especially on the borders of lagoons separated by a narrow neck of land have caused this condition. In direct opposition to this idea, many heaps are found at some miles from the salt water, but even these may be accounted for by the action of the waves in low sections.

These shell heaps are multitudinous on Indian river, and also Halifax and Hillsboro rivers and Lake Worth, all of which are lagoons of salt water. If the larger heaps were joined together they would foot up many miles of shell wall fully fifteen feet high, while the smaller heaps are so numerous as to be almost continuous for miles and miles in certain sections. In truth, it may be said, that over a large portion of the state, it is next to impossible to step without treading on the remains of some form of animal life, either visible to the observer, or lying just beneath a thin covering of earth. When we compute the enormous consumption of bivalves which those earlier oyster gourmets must have devoured in order to erect these piles of shells, we are inclined to the theory of the wave action. Verily; we can appropriately use the words of Bryant, when considering the oysters of Indian river

"All that tread
The globe are but a handful to the tribes
That slumber in its bosom."

For the living examples are comparatively few, and I can demonstrate that these creatures do walk (crawl) on land; in addition to which, some are seen hanging to the branches of trees.

Many of these shell heaps are so well covered with soil, while thick scrub palmettos are growing over them, that their presence is not suspected, unless one has to dig down a foot or so, or next the water where the waves have washed into the pile and undermined the bank, and left the material of which they are made exposed.

They are nearly all composed of nothing but shells, together with the natural dirt accumulations of ages, and a few bones. These shells greatly resemble the common oyster of commerce, *Ostrea virginiana* and to me, are identical with the species of the region of the present.

These mounds, apparently rising from the water's edge, when on the shore, are often washed out at their bases by the waves, and can be readily measured as to height. It is quite common to find them fifteen or twenty feet high, and one that I measured was over twenty-three feet. It was over four hundred feet long, and fromt hirty to sixty feet deep back from the river. Huge palmettos were growing on the mound, and reasoning from the slow growth of this tree, it is reasonable to judge that many were two centuries old.

There is a large heap on the western shore of Indian river about opposite Pelican island and below St. Sebastian; known as Barker's Bluff, and which is very clean and free from impurities. There is a house perched on top, and the owner, afraid of his position, has prohibited excavating below. Several trees of the cabbage palm species have toppled from the edge into the water.

Several heaps of twenty-five to thirty-five feet in height were reported to me by reliable authorities and one heap at over fifty feet, but I did not measure them.

In addition to the common oyster shells which constitute over nine-tenths of the heaps, aside from the dirt, there were many other species of shells, and also at times many bones. Among the latter I identified the remains of a turtle, deer, raccoon, opossum and porpoise, while the vertebræ of what I took to be a shark were plentiful.

In several heaps, skeletons were found. and the usual stories of the great size of the originals were started. Twelve skeletons were exhumed from one heap on the river bank. but as these remains were always near the top of the heaps, it occurred to me that the burials might have been made by comparitively recent tribes, and that these elevated points were selected because of their known dryness. Another evidence of the probable recentness of the burials was presented in the use of charcoal, which was found with the remains. I have repeatedly found charcoal, with the bones in the smaller tumuli in Michigan, and think this an evidence of recent date. One skull which was examined pointed to the typical American aborigine.

It is a singular fact that the present aboriginal inhabitants of Florida have no liking for oysters and we were informed by several Indians that members of their tribe never ate oysters unless other food was scarce.

In conversation with Billy Bowlegs, a very intelligent Seminole, grandson of the original Billy, he informed me that the traditions of his tribe offered nothing pertaining to these mysterious shell heaps.

MORRIS GIBBS,
Kalamazoo, Mich.

List of Texas Mollusca, Marine.

Collected by J. D. Mitchell, Victoria, Texas.

Spirula Peroni. LAM.

Dead shells on beach of Matagorda and Corpus Christi Bays; also on Gulf beach.

Murex spinicosta, or fulvescens SBY.

All along the gulf coast visited by me—dead shells only.

Purpura Floridana. BAR.

This conch is very numerous in the deep waters of Matagorda Bay where it is playing great havoc on the oyster beds, drilling and eating the young oyster. They are fast destroying the deep water beds around Palacios Point, Matagorda Bay. The Greek and Italian oystermen cook and eat them. They taste like an oyster which may be from their feeding on them.

Purpura hæmastoma. LINN.

This conch lives in shallow water on shelly ground. It has a habit of crawling up on anything that projects above the water and taking a sun bath.

Tritonidea tincta. CON.

I got some fresh shells from Hermit crabs, near east end of peninsula, gulf.

Fasciolaria distans. LAM.

Several tolerably well preserved shells taken from Hermit crabs on peninsula shore and gulf; found beach worn shells on Mustang island, gulf beach.

Fasciolaria gigantea.

Two beach-worn specimens on Matagorda Island, gulf beach.

Fulgur carica. L.

I found two beach worn specimens on peninsula gulf beach.

Fulgur perversus. L.

I found this conch alive and in some places associated with *F. pyrum* but not so common.

Fulgur pyrum. DILLEVYN.

I found this live crawling in the sand on the sand bars in the gulf on the peninsula, Matagorda Island and Mustang Island.

Nassa vibex. SAY.

I found this living on the flats of Espiritu Sancto Bay, and dead shells in Carancahua Bay and Shell Bank, Corpus Bay.

Oliva litterata. LAM.

Gulf beach on Matagorda Island, St. Joseph's Island and Mustang Island. On the west end of St. Joseph's Island they are quite numerous and can be caught the same as the *Natica.* They leave a trail as if the finger had been drawn through the sand. At the last named place I secured fifty-four in an hour this way.

Strombus pugilis. LINN.

I found one live specimen at Pass Cabello and dead shells on Matagorda island and Mustang island, gulf beach.

Cassis inflata. SHAW.

Gulf beach from peninsula to Cedar Bayou. Have found live ones thrown up by the waves, but never saw it at home.

Dolium galea. L.

Gulf, from peninsula to Corpus pass. I dredged it alive in Pass Cavallo and obtained live ones on the gulf beach.

Natica duplicata. SAY.

Common in Matagorda Bay. It burrows in sand and travels just under the surface of the sand, leaving a trail as if a stick had been drawn along. In low tides and clear water they can be caught by following this trail.

Sigaretus perspectivus. SAY,

Gulf beach from peninsula to Corpus pass. Most numerous on Mustang Island. I dredged two live ones in Pass Cabello.

Crepidula fornicata. LINN.

Matagorda Bay and Espiritu Sancto Bay. Found some very fresh shells but no live ones.

Crepidula plana. SAY.

Very plentiful in Matagorda Bay, at old Indianola and Pass Cabello. A favorite place for it is inside of the lips of conch shells occupied by hermit crabs.

Solarium granulatum. LAM.

All along the gulf beach from peninsula to Aransas Pass. Very numerous on Matagorda Island. I never saw a live one.

Ianthina communis. LAM.

Found in Matagorda Bay and on Mustang Island. No live ones found.

Turritella variegata. LINN.

I found live young ones in Carancahua Bay and fresh dead shells in Matagorda and Espiritu Bays.

Vermicularia spirata. Phil.

I found this living on the mud flats at the head of Matagorda Bay, and dead shells occupied by Hermit crabs in Corpus Bay.

Serpula dianthus. VERRILL.

I found this living in Carancahua and Matagorda Bays. In the first named place they located on a small oyster bed and in one summer destroyed every oyster. They interlaced their cells over the oyster's mouth and all over it so thick as to starve the oyster out.

Cerithium variabile. ADAMS.

Carancahua and Espiritu Sancto Bays—dead shells only and some occupied by young Hermit crabs.

Cerithidea Hegewishi. PHIL.

Found living on flats, head of Matagorda Bay also in Carancahua Bay and dead shells at Shell Bank, Corpus Bay.

Littorina irrorata. SAY.

Plentiful along the shores of Turtle Bay, Carancahua Bay, Keller's Bay, Lavaca Bay, Matagorda Bay and Espiritu Sancto Bay. It climbs the stalks of the salt rushes and sucks their juices.

Modulus modulus. LIN.

Dead shells occupied by Hermit Crab. Carancahua Bay and Espiritu Sancto Bay.

Neritina reclivata. SAY.

Common in some places as *Littorna Irrorato.* It collects in numbers around the rush stems at the ground. I never found them feeding on the rushes.

Bulla occidentalis. ADS.

Matagorda Bay and Shell Bank, Corpus Bay. Fresh shells but no live ones.

Haminea antillarrum. OOB.

I found this live on the flats of Espiritu Sancto Bay.

Melampus flavus.

I found it living both in the banded and plain variety on the margin of Carancahua Bay. This is really a land shell. It lives in moist places near the shore, hiding in the day time under drift wood, sea moss and anything that will keep them from the sun and their enemies, and coming out at night to feed. They will also come out on a wet day. I have seen the dead shells in the drift on Port Lavaca Bay and Espiritu Sancto Bay.

Toredo navalis. L.

The terror of ship owners; plentiful in drift timber everywhere that I collected.

Pholas Campechiensis. GML.

Dead valves on beach, Matagorda Bay.

Pholas costatus. LINN.

This beautiful shell I found in Matagorda Bay on the sand bars near Carancahua Bay. It burrows from 16 to 24 inches deep. The first six or eight inches is a small hole one-half an inch in diameter up which the fish thrusts its long neck to reach the water to feed, the balance of the cell is large enough for the animal to move up and down. In time of danger it retires to the bottom and draws in its neck. Both tubes are enclosed in one covering and the incoming tube is armed with cilia to keep out sand and other material not wanted.

Pholas truncatus. SAY.

I have not found this shell living, and have only single valves from beach found on Matagorda Bay, Espiritu Sancto Bay.

Solen Americanis. GLD.

I found this shell living in all the bays from Matagorda to Corpus except Mud bay, in that I found no shell life though I did not search very closely. There may be two kinds, or it may be the location which makes them grow larger in some places than others. Those I found on the south shore of Matagorda Bay being about twice the size of those found elsewhere. It lives in a cell about four inches deep, coming to the top and sometimes standing half way out of the sand to feed. It disappears quickly at the approach of danger and by a series of quick kicks, can get around quite lively in water.

Periploma angulifera. SAY.

Single valves on Gulf Beach, Peninsula and Matagorda Island.

Mactra Brasiliana. LAM.

Quite common in Carancahua Bay, Matagorda Bay and Espiritu Sancto Bay. It buries slightly in the mud or sand.

[*Continued next week.*]

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Lockport.....		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

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Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
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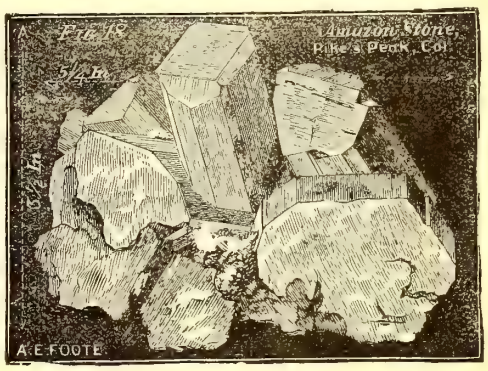

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In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

I have received enough replies from my first notice to convince me that NATURAL SCIENCE NEWS is a first-class advertising medium. R. C. ALEXANDER, Plymouth, Mich.

From a little 35 cent adv. on this page in NATURAL SCIENCE NEWS of Feb. 9th Mr. Henry Clark of Gaines, N. Y., received cash orders for $15.50 worth of Ferrets.

Enclosed please find a notice which I should like inserted in your valuable paper the NATURAL SCIENCE NEWS. The other ad. paid me well, I managed to obtain many additions to my collection, through the same. PHIL K. GILMAN, Oakland, Calif.

In the last seven years I have advertised my process of embalming in twenty-seven papers and magazines. For the number of replies and direct returns, your NATURAL SCIENCE NEWS advertisement eclipses all previous seasons, and discounts all other amateur, local and general attempts. Respectfully Yours, MORRIS GIBBS, M. D., Kalamazoo, Mich.

Mammal Skulls.

Cleaned. With data. All fine specimens.

American Otter	$3 00
Mink	1 00
Gray Fox (one, imperfect)	50
Muskrat	60
Cotton-tail Rabbit	75
Cotton Rat	40
Red Bat	40

And many others, all postpaid. Some prices of Bird Skulls will appear soon.

Skins of Birds and Mammals. Live Reptiles, live Batrachians, ditto in alcohol. Embryological material.

H. H. & C. S. BRIMLEY,
Collectors, Dealers and Taxidermists,
RALEIGH, N. C.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Mounted Specimens at a Bargain!

All specimens are strictly first-class, mounted on walnut perches.

Widgeon	$2 25	Shrew Mole	1 00	Pin-tail Duck, in wall case	5 00
Shoveler	2 25	Brown Bat	75	Ermine, in wall case	3 50
Cinnamon Teal	2 15	Golden Plover	1 75	American Osprey	3 50
Wood Duck	2 00	Chachalaca	3 00	Short-eared Owl	2 00
Sora Rail	1 25	White-tailed Kite	3 00	Barred Owl	2 00
Bartramian Sandpiper	1 75	Sharp-shinned Hawk	1 75	Screech Owl	1 50
Gray Fox	6 00	Nighthawk	1 25	Great Horned Owl	3 25
Red Fox	8 00	Arkansas Kingbird	1 25	Saw-whet Owl	1 75
Raccoon	4 00	Stellar's Jay	2 00	Burrowing Owl	1 75
Weasel	2 25	Oregon Jay	2 50	Scaup Duck, in wall case	5 00
Ermine	2 75	American Crow	2 00	Mountain Lion	25 00

SKINS.

Holboel's Grebe	$ 75	Black Duck	$1 00	Redpoll	$ 15
Pied-billed Grebe	60	Peacock	3 50	Blue-winged Teal	50
American Herring Gull	75	Wilson's Snipe	40	Shoveller	1 00
Red-breasted Merganser	1 00	Great Yellow-legs	60	G't Blue Heron, fall plum.	1 25
Sharp-shinned Hawk	50	Marsh Hawk	65	" " spr'g "	3 00
Goshawk	1 25	Sparrow Hawk	25	Screech Owl	50
Hairy Woodpecker	20	Short-eared Owl	75	Meadowlark	20
Rusty Blackbird	20	Stellar's Jay	75	Snowflake	15

ROUGH SKELETONS.

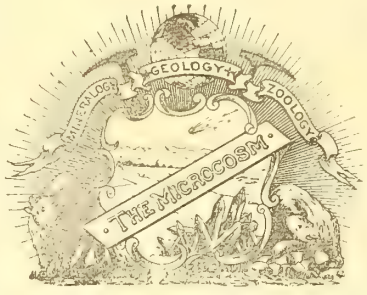
Red Fox	$2 00	Great Blue Heron	$ 75	Muskrat	$ 35
Red Squirrel	20	Mink	50	Parrot	40
Screech Owl	25	Brown Bat	25	Northern Shrike	25
		Horned Lark	50		

We have just issued our new price list of **Bird Skins, Mounted Birds** and **Mammals**, and **Custom Work in Taxidermy.** Send for a copy.

RAW FURS BOUGHT IN SEASON.

GEO. F. GUELF,

PRACTICAL TAXIDERMIST, BROCKPORT, N. Y.



Relief Maps,

Systematic Collections,

FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals.

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). SEND for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C.

The Archæologist.

INCORPORATED COMPANY.

AN ILLUSTRATED MONTHLY MAGAZINE, DEVOTED TO

ARCHÆOLOGY, ETHNOLOGY, HISTORY, AND GENERAL ANTHROPOLOGY

This will please Collectors.

Subscription, $1.00 per year. Sample copies free.

W. K. Moorehead, Editor.

Address THE ARCHÆOLOGIST, BOX 502, COLUMBUS, O.

FRANK B. ARMSTRONG,
TAXIDERMIST,
and Collector and Dealer in
Bird and Mammal Skins,
Birds Eggs in fine sets, Mounted Birds and Animals.
Alta Mira, Estado de Tamaulipas, Mexico.

BAKER & HANSON,
Collectors of
Florida Sea Shells and Curios.
Bird Skins and Eggs a Specialty.
PRICE LIST FURNISHED FOR STAMP.
FORT MYERS, FLORIDA.

NATURAL SCIENCE NEWS.— I want *at once*, copies of Nos. 1 and 2. (Feb. 2d and 9th) for each copy returned I will send a copy of either the YOUNG OOLOGIST or OOLOGIST. I have some very interesting copies of the former —10 years old—you could nearly consider them as relics. Send as many as you can spare and I'll see that you do not receive duplicates in return. Should you prefer I will send you a credit card, good for 5c per each copy returned. FRANK H. LATTIN, Albion, N. Y.

I AM building up a general scientific collection, embracing all departments of the Natural Sciences and if you have anything truly desirable to offer in exchange for anything I may have in stock or if you have any standard books or publications that you wish to dispose of I shall be pleased to correspond with you. When writing give full descriptions stating your lowest exchange price and give me an idea of about what you would like in return. FRANK H. LATTIN, Albion, N. Y.

Natural Science News.

VOL. I. No. 9. ALBION, N. Y., MARCH 30, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO ALL sending me fifteen cents silver, I will send materials and instructions for making a *lead tree*. A beautiful curiosity. Grows itself. Address R. M. MILLAR, 532 Dufferin Ave., London, Ont., Can.

FOR SALE.—Navajo blankets, Mexican pottery, opals and curios. Write for prices. CLIFF HALE, Phœnix, Arizona. 9w4

EXCHANGE stamps, few minerals, hawthorne thorns, for shells, curios. Hollyhock seeds for sale. 5cts. packet. 25ct. order recieves free packet. HARRY SIMONS, Oak Lane, Philadelphia, Pa.

WANTED.—A set of Moose horns. Will give cash or good exchange,. Will exchange bird and small mammal skins for skins and eggs in sets with data. JOHN CLAYTON, Lincoln, Maine.

WANTED.—Correspondence with collectors who will exchange specimens with me the coming season. Also foreign collectors wanted! All answered. PAUL L. SCHAEFER, Addison, Ills.

STAMPS, reducing stock. For 52cts. we will send postpaid $2 worth of fine, clean, untorn stamps: none cataloging at less than 3cts. and mostly over 5cts. each. No Seebecks or trash. Money refunded if stamps are returned within ten days with postage. Agents wanted at 50 per cent commission. Address at once, EQUITABLE STAMP COMPANY, W. Orange, N. J. Established 1890.

FOR EXCHANGE.—L. F. W. and Marine shells to exchange for same. E. J. POST, Tampa, Fla.

WANT the *first* 36 and *last* 13 numbers of *The Great Divide* in 1st class condition, have *fine* foreign stamps to exchange, also want old U. S. stamps. GEO. W. VOSBURG, Columbus, Wis.

WILL EXCHANGE six packets of choice flower seeds for two perfect flint, Indian arrowheads or two foreign coins. FRANZ E. TRIPP, Garden Prairie, Boone Co., Ills.

TO EXCHANGE.—"Birds of Kansas" Goss, old, "Bird Preserving and Bird Mounting," Avis, new, for small cabinet specimens of fossils, curios, etc. J. M. WOLF, Garden City, Kans.

PET RACCOON, one year old, for eggs in sets or books on natural history. Send list of what you have to offer. A. H. MILLS, West Rutland, Vt.

MICROSCOPE.—Cost $8. Will exchange for *first-class* bird skins or sell cheap for cash. Address L. G. WOODRUFF, 202 West 103d St., New York.

I WILL give 20 different fossils for every dozen arrow points sent me. All answered. J. M. KILVINGTON, Box 377, Mason City, Ia.

TO EXCHANGE.—Davie's Nests and Eggs (paper) for best offer of stamps with album or birds eggs in singles. Address ROBERT J. HARDING, Chatham, N. Y.

I HAVE many kinds of sea shells and curios, for sale in any quantity wanted. Also have ladies' and childrens' palmetto hats cheap. Send for samples of the braid. IDA B. KIMBALL, New Cadiz P. O., Hillsboro Co., Fla.

TO EXCHANGE.—One set of four (4) boxing gloves, youths' size, cost $2.50. For best offer in stamps, books or supplies for Oologists or Naturalists. W. CARL ACKISON, Charleroi, Pa.

I WANT lowest cash price on 2000 small Starfish. Will give a 11 jewel, gold filled Rockford Watch Case Co. watch for 1200. Also want 5000 horn nuts. R. E. BARTLETT, Rockford, Ill.

NATURALISTS please send me all of your Wisconsin notes on breeding, nesting, food, migration, etc. of our birds. I am writing up a list to be published in the *Nidiologist*. GEO. W. VOSBURG, Nat., P. O. Box 307, Columbus, Wis.

TO EXCHANGE.—12 copies Western Garden and Poultry Journal, March 1892; February, 1893: value $.50, 70 copies Twentieth Century, Feb. 27, 1890—June 24, 1891, value $2.50, for Natural History publications or offers. ROY A. COOK, Independence, Iowa.

WANTED.—5 or 10 lbs 6 or 8 point Roman type. Will give stamps, books, lead cutter or cash. CLYDE L. SMITH, Oblong, Ill.

CASH for 5x7 or 5x8 focusing camera with outfit (prefer a new model improved) and mandolin in first-class condition. Parties meaning business will please send a full description of their camera or mandolin. A. L. VIDAL, care of P. O. Drawer C, Gainesville, Fla.

WANTED.—A good kodak of standard make, 4x5 preferred. F. R. NOBLE, South N. Drug Store, Nashville, Tenn.

COLUMBIAN envelopes unused, climbing irons, silver watch for best offers. Enclose stamp for description of articles. L. L. LEWIS, Drawer 107, Copenhagen, N. Y.

WANTED.—A second-hand copy of Coues' Key, in good condition, for which will pay part cash. Also want other standard works on Ornithology and Oology. State lowest price. J. S. BURGIN, Blacksburg, S. C.

EXCHANGE.—During the coming season I would like to exchange with collectors of eggs in sets with datas. Many common ones desired. All answered. TILLMAN BIBB, 807 Cherry St., Ft. Worth, Tex.

"PSEUDOMORPHS of Limonite after Pyrite" perfect cubes, elegant specimens. Will send prepaid at following low rates: Single specimen 10c, 3 for 25c, 12 assorted sizes for 75c. W. R. GRAY, Oakton, Va.

TO EXCHANGE.—250 var. stamps for best offer in bird eggs with data, named shells, Columbian or Confederate stamps, curios or 32 double acting revolver. C. N. STURTZ, Adamsville, Musk Co., O.

WANTED.—A Winchester repeating shot gun, model '93. Can give in exchange a Winchester repeating rifle and Indian relics, minerals and birds' eggs. GEO. W. DIXON, Watertown, S. D.

FOR EXCHANGE.—Camera 4x5 tripod, two rubber trays and printing frame, fair condition, value $7.00, for bird skins, minerals or curiosities, etc. RICHARD McMURTRIE, East Coulter St., Germantown, Phila. 8 w2

MINERALS.—25 nice specimens by mail, 35c. W. S. BEADLES, 814 W. Marshall St., Richmond, Va. 7w3o

COLLECTORS LOOK HERE!—Send me 14c in stamps and I will send a fine cabinet specimen of 50 per cent black copper ore. Will exchange minerals and Indian goods for good watches and books. W. F. STONE, Junction, Lemhi Co., Idaho.

AIDS TO COLLECTORS.—Nothing will aid you more than a fine bird dog to find nests. I have fine Pointer and English Setter puppies to trade for birds' eggs or skins, or cheap for cash. J. H. BROWN, 1708 Grand Ave., Davenport, Iowa.

TO EXCHANGE.—New copies of O. & O. Semi-annual and Wilson's Quarterly, for scientific books or publicatons. State what you have. LYNDS JONES, Oberlin, Ohio.

WANTED.—Camera: Cash, or part cash and part exchange in eggs, skins, photos., 4x5 roll holder, fine focusable lens, or exchangeable, high grade, up-to-date camera. Fair price, perfect working condition, at once. For Sale: sets, photos. of eggs and nests in situ, of Miss. Kite, Broadwing and Krider's Hawks, and other rarities. Fresh skins, Waders and Swimmers. Low price, fine preparation. Stamp for list. P. B. PEABODY, Wilder, Minn.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

FOR EXCHANGE.—Single barrel, unused, Shattuck gun, 25 brass shells and loading tools complete, for best offer of rare eggs in sets. Raptores preferred. *Especial desiderata* A. O. U. Nos. 131 and 327. THOMAS H. JACKSON, 343 E. Biddle St., West Chester, Pa. 5w4

CANOE YAWL "ACORN," built by St. Law. Boat Co, in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N. Y. tf

FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

ORNITHOLOGY and OOLOGY.—I want to obtain a quantity of back numbers of various publications relating to BIRDS and will allow prices as follows for the same. Will accept any number of copies not to exceed 10 of the same issue. All must be *complete* and *clean*. "Bulletin of the Nuttall Ornithological Club" and "The Auk" 30 cts. per copy. "The OOLOGIST" (published at Utica, N. Y. and Rockville, Conn., 1875-81); the "Ornithologist and Oologist;" and "The Nidiologist;" "Random Notes on Natural History" Prov., R. I. 5c per copy "Wisconsin Naturalist:" "The Taxidermist;" I will allow 3 cts. per copy. I will allow the above amounts in payment for specimens, instruments, supplies or publications or if you prefer will send credit check for the amount. All publications must be sent *prepaid* (you can mail them as "second class mail matter" @ 4c per lb.). "Returns" will be sent prepaid unless otherwise specified in catalogue. I can also use the following second-hand books on same conditions at prices quoted *prepaid*. Must be in A No. 1 condition. Coues' "Key to N. A. Birds" $4.50; Ridgeway's "Manual of N. A. Birds" $3.75; Davie's "Nests and Eggs of N. A. Birds, 3d or 4th; editions, cloth, 85 cts, paper 65 cts; other *standard* publication will be accepted at one-half publishers prices. This notice will remain in force until April 15, 1895. After that date write what you have to offer before sending. FRANK H. LATTIN, Albion, N. Y.

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

I received reply after reply to my ad. in the NATURAL SCIENCE NEWS. FRED E. POMEROY, Lewiston, Me.

I received many answers to my card and it is a valuable advertising paper. L. L. LEWIS, Copenhagen, N. Y.

In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

I have received enough replies from my first notice to convince me that NATURAL SCIENCE NEWS is a first-class advertising medium. R. C. ALEXANDER, Plymouth, Mich.

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THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

North Carolina Quartz.

E. H. HARN, Collector.

Many different colors with water bubbles and various inclusions. Single crystals and groups of all sizes. Specimens sent on approval.

Address, J. H. RUGG,

4tf Box 262, Blairsville, Pa.

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60 cents worth in value FREE

if you collect

BIRDS' EGGS.

Mention NATURAL SCIENCE NEWS and send 2c stamp for illustrated catalogue.

No. 0 Egg Drill	15c
" 1 " "	25c
" 2 " "	35c
" 3 " "	50c
" 4 " "	60c
" 5 " "	80c
" 6 " "	$1
Blowpipes	15 and 25c
Hand Egg Blower, very best	$1.60
Embryo Hooks	10 and 20c
Data Blanks per 100	15, 20 and 25c
Climbing Irons, best made, prepaid	$3
Scalpel with Brain Spoon	60c
Scalpel, ebony handles	60c
Calipers for measuring eggs	$1
Artificial Leaves, 6 kinds, assorted, per gross,	60c

"Our Pet" Mineral Collection,

of 52 specimens all named, such as usually sell for 5 and 10c each, we will send prepaid for ONLY $1.00.

CHAS. K. REED,

TAXIDERMIST,

And Dealer in Naturalists' Supplies, Curiosities, Shells. etc.

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INDIAN RELICS! Send 2 cent stamp for list and drawings of same. Rare Goods at Bottom Prices. Always have in stock some very fine Geodes, Minerals and Curiosities.

W. PERRY ARNOLD,

tf STONNINGTON, CONN.

The Ebersolds,

10 PERSONS.

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We make collections and photograph everything of interest to be found on the East coast of Florida, Shells, Curios. Bird Skins and Eggs, Alligator and other animal skins, Teeth and Skulls, Curious Fishes, Snakes, Butterflies, Bugs and Moths, Beautiful Hard Woods, Botanical Specimens, etc. Write to us for anything you want, and if we do not have it in stock, will do our best to secure it for you.

Send 25 or 50 cents for a collection of Shells, Photographs and Curios. Address,

D. S. EBERSOLD, Oceanus, Brevard Co., Fla.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Embalming! Mounting!

Artistic, Durable, Satisfactory!

Do you want to learn to mount birds in a lifelike and satisfactory manner?

Do you want a reliable method, and at a very reasonable figure?

Do you want a process of mounting which you can learn, in one lesson?

Then write for my process of Embalming, which is sure to please you.

The method, is embalming the body almost entire, and the resulting adjustment of the wings, head and legs is more satisfactory, and gives better results than from any other process in modern taxidermy, and is far superior to all other methods in this respect, because so easily understood.

If you are a first-class taxidermist, you do not need this method, for you have already spent years in learning the trade: however, you could learn a valuable lesson in the art of posing a bird, for this method is superior to all others in this respect.

But it is to the beginners that my process appeals.

There are thousands of boys and girls, as well as grown persons, who wish to mount specimens, yet who have no means of learning.

It costs from **ten to fifty dollars** to take a course of instruction from a competent teacher, in the art of taxidermy, and at those figures, the best points are not learned.

It takes from $5.00 to $10.00 to buy a good work on Taxidermy, and it is a well known fact that without assistance, few, very few, succeed.

If you purchase, this process, it will cost you **75 Cents** for one pound of the Compound, and the printed instructions.

One pound of the Embalming powder will fully prepare and preserve 40 to 50 small birds, and it is guaranteed to keep 20 birds the size of a robin, forever.

TESTIMONIALS.

Testimonials from boys are to be expected and I have hundreds of them; but I, also have over (200) letters of commendation from leading professional men, doctors, ministers, professors of first-class colleges, and even regular taxidermists have advocated and extolled my process; while parents, of children who were too young to write, have told of the success of this method, and which they have taught to their children.

A Few Testimonials.

Have found your process a success. Birds that I mounted look well. Am satisfied.
F. A. NORTON, Normal School, Ypsilanti, Mich.

Your process works well. I am thoroughly satisfied.
L. B. HARTZELL, Crystal Springs, Kas.

The instructions and embalming compound received. My son is making rapid progress for one so young. Is filling the house with mounted birds. D. F. STUCK, M. D.

DEAR SIR:—The process is a great success and gives me much pleasure. My little girl can mount birds in a life like manner after two weeks' practice, much to her delight. She is eleven years old. My boy of fourteen succeeded at the first attempt. Your method of shaping the body and wings is superior to all others. MRS. H. B. JOHNSON.

Swindles!

Counterfeits!!

Imitations!!!

There are many imitations of this process and they are all advertised as **just as good!** The truth is, they are worthless productions; the preparations being composed of inert ingredients put up by irresponsible persons, while the directions are invariably merely garbled copies of my instructions.

The ingredients of my compound cost heavily, even at wholesale, but by purchasing largely, and by a superior process of mixing these poisons, there is a small profit if many orders are taken.

"$100.00 Reward!"

Many are unbelievers as to the efficacy of this compound, as they think it cannot preserve flesh.

One Hundred Dollars Reward

Will be paid to the person proving that one ounce of the compound will not preserve one-half pound of beefsteak, porksteak, mutton or fowl, forever. The meat can be hung in the sun immediately after it is prepared, and will never be infested with fly blows.

Will Meat Shrink?

Certainly it will! But by a method which is fully explained in the instructions, this shrinkage is easily, and fully compensated for in a simple manner, and the specimens require less attention than specimens mounted in other ways.

Specimens which I mounted by this method over twenty years ago, look well today and hold their freshness and shape much better than with birds mounted in traditional style (stuffed).

Questions answered fully if letters contain stamps.

Price of Instructions and one pound of Compound, enough for 20 to 40 small birds, 75 cents.

Fewer tools required than in any other method. Only a knife, file and wire required. The quickest method, and entirely satisfactory.

Address all letters to

MORRIS GIBBS, M. D.,

KALAMAZOO, MICH.

Natural Science News.

VOL. I ALBION, N. Y., MARCH 30, 1895. No. 9

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

TERMS OF SUBSCRIPTION.

PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN, Albion, Orleans Co., N. Y.

Work on an Ostrich Farm.

The ostrich farms of South Africa are very curious and interesting places. The equipments are generally very simple and inexpensive and the crop is found to be very profitable. The first requirement of an ostrich farm is a "camp" or pasturef or the birds, and these vary in size from 3,000 to 8,000 acres. Such a camp generally holds comfortably about 300 ostriches. The camp must always be good pasture ground, and here the birds remain for the entire year, except when they are brought together once every four months to be plucked.

The ostrich builds its nest in the sand in a very careless fashion and here it lays its eggs. The nest is crudely constructed, consisting simply of a round hollow carved out in the sand. Sometimes the female bird scratches this hole or nest, but the nest is generally formed by the birds having set continuously upon one spot for a long time. One bird will lay from ten to twenty eggs, but often three or four birds will lay in the same nest. Often there will be as many as seventy or eighty eggs in a single nest. In this case most of the eggs are taken out, since an ostrich cannot cover more than sixteen eggs. About forty-four days are required for hatching, and when a nest is hatched the little birds are brought under cover and fed. They are usually fed both morning and evening on barley or rape.

When the time comes to pluck the birds, the real work on an ostrich farm begins. They are usually rounded up by a number of men on horseback. At first they are very fierce, but when all are huddled together in a kraal every bird becomes docile and manageable. The birds are taken one at a time and a bag or stocking is placed over its head. It is then quickly clipped by two skilled attendants. The prime feathers are usually plucked in June. Prime feathers are the long white fancy feathers, and they number from eighteen to twenty on each wing. Four months after this picking the stumps of these feathers are drawn out, and two months after this the "primes" or short black tail feathers are taken out. The general rule in plucking is to obtain as many feathars as possible without injuring the ostrich or robbing the bird of a suitable winter coat.—*Sciemtific American.*

The Plymouth Meteorite.

By Henry A. Ward.

The Plymouth meteorite was found in the year 1883 by Mr. John Jefferson Kyser, while plowing in a field on his farm, about five miles southwest of the town of Plymouth, Marshall County, Indiana. Mr. Kyser had about the year 1872, found in the same field another, larger mass of the same iron. This mass was pear-shaped, about 4 feet in length by 3 feet in its widest diameter, narrowing to 6 or 8 inches at its upper end. It lay for a year or two so near the surface of the ground as to be annoying in plowing the field. On that account Mr. Kyser, aided by his son, dug a deep hole by the side of the mass and buried it to the depth of 1½ to 2 feet beneath the surface, where it should thenceforth do no damage.

The account of this I had last June from the son, Mr. John M. Kyser, now city clerk of Plymonth. Mr. Kyser, well remembers the circumstance of the finding of the large piece and assisting his father in burying the same; and he further thought that, notwithstanding the removal of certain landmarks (a fence and a tree) in the field, he would still be able to locate it very closely. This he subsequently undertook to do by trenching, but was unsuccessful in finding the mass, I was myself present and assisted in a further search for it in September last, using a surveyor's magnetic needle, with the hopes of the same being attracted to the mass and discovering it but all to no purpose Mr. Kyser seems to feel very confident of his knowledge of the immediate vicinity of the mass where he buried it 22 years ago, but is unable to prove its presence by rediscovery. Nor has he the aid of another eyewitness, his father having died soon after the original finding and burying as above mentioned.

The smaller piece, which was, as before said, found in 1883, was presented by Mr. Kyser, Sr., to Mr. W. S. Adams, who at the time, kept a plow factory in the city of Plymouth. It was retained in their family until last November, when it was brought to Ward's Natural Science Establishment in Rochester, N. Y., by Mrs. Adams, from whom I procured it.

The mass is a lengthened, tongue-like form, not unlike a rude mound builder's ax. Its greatest length is 12½ inches, its width 7⅜ inches, its thickness in the middle about 2 inches, from which, in the greater part of its length, it slopes in a somewhat even manner to a thin, rounded edge.

Its surface is deeply eroded by oxidization, so that, although sound and free from scales, it shows no signs of an original crust. The characteristic pittings of meteorites are also by the same cause rendered somewhat feeble, although still quite clearly visible. We have cut a number of thin slices from the mass. These etched in dilute nitric acid give very clear Widmanstatten figures. There are, further, several small nodules of troilite.

A careful analysis of this iron has been very kindly made for me by Mr. J. M. Davison, of the Reynolds Laboratory of the University of Rochester, and I give the same below.

ANALYSIS OF PLYMOUTH METEORITE.

Fe	88·67
Ni	8·55
Co	0·66
Cu	0·24
P	1.25
Graphite	0·11
S	0·07
	99·55

This iron, herein briefly noticed, is interesting in many ways, and it

is much to be regreted that the large mass, of which the record seems to me to be entirely reliable, cannot be rediscovered.—*Amer. Jour.*

Exfoliation in the Tortoise.

By Dr. Morris Gibbs.

For many years much interest has attached to the process of skin-shedding in the reptilian order. This periodical exuviation is a well known condition to most of our observers, and the process with serpents has been extensively written upon. But the writer is not aware that desquamation has often been observed in the bony-shelled reptiles. It is to be doubted if the process ever occurs as a periodical condition with our turtles and terrapins at the North, and probably not in warmer latitudes.

During several seasons a number of specimens of so-called turtles, terrapins and tortoises of various common species, were studied in confinement. But they never gave evidence of shedding the epidermal scales, and neither could it be ascertained that these creatures exfoliate in the wild state.

Variations from normal habit often gives rise to peculiar conditions, and a change in the conditions which surrounded a common Box Tortoise. *Cistuda carolina* (Linn.), gave me the opportunity of noting desquamation, and drawing conclusions. As the process was an interesting one, and has not been described, so far as I can learn, a short sketch will be given.

All of our reptiles at the north, so far as known, hybernate during at least five months of the year. This tortoise follows this habit—going into seclusion in the dead leaves and mold in October and emerging from its retreat in the following April. I have observed the habit repeatedly in both the wild as well as with the confined individuals.

A young friend of mine owned a Box Turtle, and at the beginning of cold weather took his pet within doors. It fed, as usual, entirely on vegetables, preferring celery shoots to all other food. The house was steam-heated, and the even temperature kept the tortoise active throughout the winter.

During the coldest part of the season, Dick, as he was called, began to shed his plates. This act was in no way accompanied by evidence of disability, as the creature was active throughout the process of desquamation and continued to eat as usual. The neural plates, as they are called, those lying over the line of the spine, loosened first, the costals or rib-plates next and the small marginals last on the carapace, or upper shell. The plates of the plastron or lower shell next exfoliated, and fell off irregularly and not in order.

At the time these plates came away the framework, or shell proper had the usual appearance of denuded bone, and especially resembled the appearance of the human skull when the scalp is removed. The blush or redness departed within a couple of days, and the shell soon assumed the appearance of a dead bone.

In the shedding of the skin with snakes, the act is a simple sloughing of the external integument, and does not involve the true skin in any way. This is evident if we examine the shed skin, or mask, as it is called. We find that the outside or scarf-skin, as we call it in the human, does not possess any pigment, and the slough from the snake holds no colors, while the inner coat or new dress of the snake is very bright. But in the case of desquamation in this tortoise, all formed pigmentary matter came away, and left nothing but the bone surface. I have occasionally found small water turtles, *chrysmys*, with loosened spidermal plates on the carapace, but other plates of brighter color were found beneath.

After a week or ten days a dusky spot was seen, and shortly, other spots. These spots, first observed in the tract of the neural plates, at last came to be distinguished as centers of growth in the scales, or outside covering. The approximate center of the prospective plate could be told, as there was a slight groove where the plates joined, showing on the denuded surface of the ribs. As is well known, the plates do not correspond in shape, size or number to the vertebrae or ribs, and the centers of their growth are not influenced by the centers of ossification.

In time, as the dusky markings became more pronounced, and the renewal became general, the yellow spots began to show. It time, the completely denuded surface was fully re-covered with regulation plates, which exactly represented the original excepting that the colors were brighter. The time occupied in the complete re-forming of this new growth was all of ten weeks. The tortoise was in no way incapacitated during the process, and it continued to live and thrive, and making its usual attempt to escape in the spring. It is possible that this creature was not healthy, and possibly that deprivation of its habit of hibernation induced a marked deviation in conditions of life, with accompanying changes, little known to observers.

This example shows that complete exfoliation may take place in the tortoise. It is not impossible that this process may be an occasional feature of the animal's growth. In any event, it indicates that a cold-blooded vertebrate can be completely denuded of covering, to its bones, and regain its condition, which is, in itself, a remarkable feature—either as a natural one or reparative process following ravages of disease.

In this instance, we have, perhaps, an illustration of the reparative process that follows the denuding of a species of the South, when the tortoise shell is removed by mechanical means. Strictly speaking this instance cannot be called exfoliation, as it involved tissue beneath the epidermal integument.

Kalamazoo, Mich.

The Marine Biological Laboratory at Wood's Holl.

The laboratory at Wood's Holl differs in one important respect from other seaside laboratories, such as the well-known station at Naples. Our American laboratory combines the function of a station for research with that of one for instruction, while that at Naples is exclusively for original investigation. Any one who intends to enter upon any line of research, but is unprepared in the details of technique, may acquire such preparation in the school at a great saving of time and energy. The school is also made use of by teachers who wish to keep up their knowledge of biology and the methods of study. For their benefit classes have been organized in vertebrate and invertebrate anatomy, embryology, morphology, comparative physiology, and botany. The class in embryology studies the fertilization, segmentation, and early stages of development of various pelagic fish eggs, with the variations produced by securing abnormal conditions of pressure, rupture of cell membrane, etc. ; it learns the method of killing, staining, imbedding in paraffin and celloidin, and recon-

struction. Some time is also given to the study of the holoblastic eggs of sea urchins and amphibians. One of the most important features of the course is the series of lectures and seminars, with discussions of the vital questions of biology, such as the structure and nature of cell, the questions of heredity and homology, etc.

The institution is not under the control of any school or sect, but is national in its scope and organization. Its trustees and instructors are from the faculties of Harvard, Brown, Yale and Columbia, the Universities of Pennyslvania, Chicago, and Michigan, and other widely separated schools. The school is supported by donations from friends of scientific research and by fees from students. The courses in which instruction is given are $50, and the investigators' rooms are $100, for the season.—*The New York Medical Journal.*

The Kaori Currency.

What is known as the Kaori Currency consists of the money cowry (*Cypræa moneta*) a shell of a yellowish color and measuring from two-thirds to one and one-half inches in length. It is found in enormous quantities in the Indian Ocean and is extensively used in Western Africa as currency, and many tons weight are annually imported into England and again exported for barter with the native tribes of Africa. A ton of these cowry's costs from $250 to $300 in Ceylon. These cowry's have been in African trade for many centuries.

The only money current in the large sultanate, Adamawa, in Central Soudan, are the Kaori or cowry shells. The agents of France who have been trying with indifferent success to get a foothold there, say there is a dearth in the circulating medium, and commerce is greatly embarrassed by the scarcity of other currency.

The Arab trader, Ibu Batuta, noticed this currency in use along the Niger, in the fourteenth century. The first Portuguese mariners likewise passed them among the natives all along the coast of West Africa. Originally probably these cowry shells obtained their popularity in Africa, because of their being easily adapted for purposes of personal decoration. Their value, however, is steadily depreciating.

Grant the companion of Speke, the explorer, reported that in Unjoxo the kaori money was being buried in the ground by the natives, to hide it from the despoiler. Thirty-five years ago, in the Unjoxo country ten kaori bought a cow. Now a whole load of them is required. Burton, an explorer, says about it: "It is a very pleasant sort of money to carry around. To carry £2 worth of it, it is necessary to hire a strong man."

W. J. WINTEMBURG.

The Watch as a Compass.

The following, copied from an old *St. Nicholas*, I think is worth mentioning: "Point the hour hand of a watch at the sun, that is in a horizontal direction toward the sun. Then the south point will be just half-way between the hour hand and the XII point."

The above I found to be true at any hour during the day.

H. R. C.

List of Texas Mollusca, Marine,

Collected by J. D. Mitchell, Victoria, Texas.

(Continued from last week.)

Tellina alternata. SAY.

This pretty shell is common all along the gulf coast from the peninsula to Corpus Pass, being most numerous on Matagorda Island. It occurs in all the shades of color from deep pink to white, and I have found several specimens of a canary yellow or straw color. I have seen many live ones thrown up by the waves, but don't know anything of their habits.

Donax Roemeri. PHIL.

Very plentiful along the gulf on peninsula and Matagorda Island. I have found it in four colors—white, purple, yellow and striped, the latter rare. It buries in the sand in colonies at the margin and when a wave comes in and covers them they jump up out of the sand, dance around on their foot, snap their valves vigorously feeding and as the wave recedes they disappear in the sand like magic.

Venus cancellata. LINN.

Dead shells common everywhere on the coast. The fresh shells are purple inside. I never saw a live one.

Venus mercenaria. VAR. MORTONI. CON.

I dredged this clam from Alligator Head to Pass Cabello, Matagorda Bay. They are good eating. Immense dead shells are found on the gulf beach on the peninsula.

Callista convexa. SAY.

Gulf, beach-worn valves only.

Callista gigantea. GRUEL.

Matagorda Bay; single valves only.

Dosinia discus. REEVE.

Gulf coast from peninsula to Corpus pass.

Petricola pholadiformis.

I found a colony of young ones in Matagorda Bay imbeded in the clay near the shore. Old shells on beach on Matagorda Bay.

Macoma constricta. BRUG.

I found live shells in Matagorda Bay and Carancahua Bay—dead shells in Lavaca Bay and Turtle Bay. It burrows about two inches deep and moves slowly through the sand by means of its foot.

Macoma Mitchelli. DALL.

Named by Dr. Dall. I have found this little shell only in Carancahua Bay in muddy bottoms just beneath the surface.

Macoma Tampaensis. CON.

I found this living, slightly buried on the flats of Espiritu Sancto Bay.

Cyrena Carolinensis. LAM.

This shell I found quite plentiful in Lavaca and Carancahua Bays. It buries itself in the sand or mud, keeping its beak near the surface.

Cyrena Floridana. CON.

I found only dead shells on the peninsula shore of Matagorda Bay.

Cardium magnum. BORN.

Found in quantities along the gulf from the east end of the Matagorda peninsula to Corpus Christi pass. They bury three or four inches in the sand in water from three to six feet deep. They may be in deeper water also.

Cardium Mortoni. CON.

I found this in Keller's Bay, Carancahua Bay, Port Lavaca Bay, Matagorda Bay, Turtle Bay, Espiritu Sancto Bay and Corpus Christi Bay. It burrows one inch in water from one foot to three feet, summer tide.

Cardium muricatum. LINN.

I found a colony of live specimens near old Indianola, Matagorda bay—found dead shells also on Matagorda Island, Espiritu Sancto Bay, Shell Banks and Corpus

Christi Bay. It burrows from one to two inches below the surface. I found it in the water three feet deep, summer tide.

Cardium senatum. L.

Several dead valves on Mustang Island, gulf beach.

Chama arcinella. L.

Beach-worn valves on Gulf coast peninsula.

Lucinopsis tennis. REEL.

Gulf beach; single valves only.

Lucina Jamaicensis. LAM.

I found this living on the flats in Keller's Bay, buried from four to six inches, the dead shells I found on Lavaca Bay and Matagorda Bay.

Loripes edentula. LAM.

Dead shells on beach of Matagorda Bay, have not found it living.

Cardita Floridana. CON.

Beach-worn shells on Matagorda and Espiritu Sancto Bays and all along the gulf coast visited by me.

Arca imbricata. BRUG.

Beach-worn valves all along the gulf.

Arca incongrua. SAY.

A very common shell all along the gulf coast—forms the bulk of the drift shells on Matagorda island—the most durable shell I have seen. Live ones are thrown up by the waves in great numbers.

Arca pexata. Say.

I have found this living in Matagorda Bay, and fresh shells on the gulf beach on Matagorda island.

Arca transversa. SAY.

Dead shells all along the gulf beach.

Distortrix reticulata. LINK.

I found three specimens on Mustang island gulf beach, one fresh and the others beach-worn.

Mytilus exustus. L.

Fresh shells in Port Lavaca Bay —none alive.

Mytilus hamatus. SAY.

This shell is very common wherever there are oysters, to which it fastens itself and is sometimes so numerous on the oysters as to render them unfit for market.

Modiola papyratia. SAY.

I found this shell living in Carancahua Bay, Keller's Bay and Matagorda Bay and dead specimens on beach of Espiritu Sancto Bay and Corpus Christi Bay on thd flats near Shell Bank. It fastens its byssus to the roots of sea grass.

Modiola plicatula. LAM.

This shell is abundant along the reedy shores of Carancahua Bay, Lavaca Bay and Matagorda Bay. I found four dead ones on the gulf beach, Matagorda Island. It buries itself in the mud and fastens to the reed roots with its byssus. In winter it is sometimes dry for a month at a time, but being well buried don't seem to suffer. I kept some in a cool place 22 days and they were still alive. They are not good eating.

Margaritiphora radiata. LAM.

I found this plentiful fastened to floating seaweed in Pass Cabello.

Pinna muricata.

I found two beds of these in Matagorda Bay and one at Shell Bank, Corpus. It grows well down in the bottom, the broad edge just above the bottom, it anchors its byssus to anything it can find. I found it in water from three to five feet, summer tide. It is good eating, the flavor resembling lobster. The oyster crab is its frequent tenant and companion.

Pinna seminuda. LAM.

I found fine specimens on peninsula and Matagorda gulf beach, and young ones on beach of Matagorda Bay.

Pecten dislocatus. SAY.

Living in Matagorda and Espiritu Sancto Bays and at Shell Bank. I found it on sandy or shelly bottom, on its side the colored valve uppermost, in water from one to three feet deep. By snapping its valves quickly it can travel quite freely through the water, and on one occasion I saw one come to the top of the water, the depth being three feet.

Anomia simplex. ORB.

The largest and finest specimens I found in Espiritu Sancto Bay. I also found it in Carancahua Bay, Keller's Bay, Lavaca Bay and Matagorda Bay and dead shells in Corpus Christi Bay. It fastens itself to any hard substance, wood, rock or shell, by its foot and grows to fit the surface on which it is located.

Belanus ebernus.

The most common of the barnacle family. In all the bays I visited—a curse to boatmen. It locates on any solid substance. It has a solid bottom to its cup and only one pair of valves.

Chelenobia patula. RANZANI.

This is a barnacle and locates on living objects. I have found it on the backs of turtles and crabs. It has no bottom to its cup and has two pair of valves inside of its cup.

Lepas pectinata. DARWIN.

I found young live ones floating on sea weed in Matagorda Bay and Espiritu Sancto Bay; have never seen an adult.

Gnathodon cuneatus. CON.

This shell is plentiful in all the small bays that empty into Matagorda Bay. Those found at the head of these bays and in the creeks and lakes that empty into these bays are twice the size of those found farther down these bays; in other words they grow largest in water that is slightly brackish and smallest in water that is salt all the time. Beach-worn shells are very numerous on the gulf coast peninsula and become less numerous as you go westward. I saw none on the gulf that were in any way fresh. The immense piles of Post Pliocene shells around Green Lake, Victoria county, are of this species.

Mactra lateralis. SOUTHERN VAR.

Common in all bays in which I collected. It hides in the mud or sand with its beak at the surface.

Mactra similes. SAY.

I have found fine examples thrown up on Corpus Christi Bay and Matagorda Bay, and have dredged it alive in the latter bay.

Labiosa canaliculata. SAY.

Matagorda Bay and Corpus Christi Bay, also gulf beach on peninsula and Matagorda Island. Although I found many good specimens I never found it at home.

Tagelus gibbus. SPENGLER.

I found alive in Carancahua Bay, Keller's Bay, Lavaca Bay, Matagorda Bay, Espiritu Sancto Bay, Corpus Christi Bay, and fresh shells with valves fastened together on gulf beach, Matagorda Island and peninsula. It forms a cell about 10 inches deep up which it travels, coming to the top to feed and quickly dropping to the bottom when disturbed. Stewed, they are good eating, having a good flavor.

Semele obliqua. WOOD.

Beach-worn valves on peninsula, gulf beach.

Sanguinolaria rosea. LAM.

I found some fresh shells at Pass Cabello; found none living.

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Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
Albion.....	7:05	8:20		1:00	3:25	6:45	7:55
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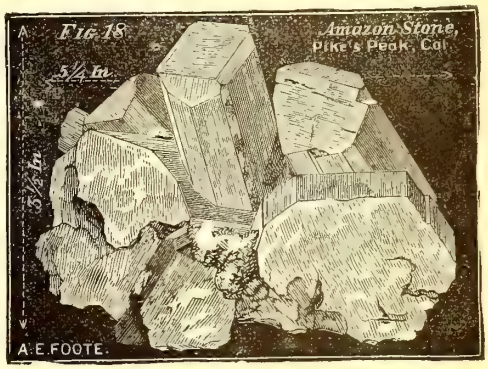

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I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c.

J. E. HANDSHAW, Smithtown Branch, N. Y.

Natural Science News.

ADVERTISING RATES.

Only 5c per nonpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

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300 "	3½ "
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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

CLIMBERS. All steel, will climb either rough or smooth bark trees. Strong and durable. With strong straps complete and ready for work. Sent to any address for $1 50. Address R. C. ALEXANDER, Plymouth, Mich.

YOU CAN GET YOUR **PRINTING** a little **CHEAPER** or a little **BETTER** by sending to **A. M. EDDY, ALBION, N.Y.** A specialty of natural history printing, catalogues, books, magazines &c. 100 envelopes. 100 letter heads and 100 cards. all for 100 cents. Send for samples of our printed stationery. 9

BIRDS Skins, Eggs, Stamps, etc., at lowest rates. 12 var. bird's skins, $1 Mounted birds, 50c. List free. F. T. CORLESS, Los Gatos, Calif. 6-12t

Just try these

Series of Minerals. You will be delighted with them.

Scale of Hardness, 9 specimens	$1 00
Color Collection, 25 "	6 00
Blowpipe " 25 "	1 00
Scale of Fusibility, 6 "	1 00
28 Microscopic mounts	6 50
12 different Cut Gems in Velvet Case	6 00

Systematic Collections

for Schools and Museums, mounted on blocks and scientifically labeled and arranged according to Dana, viz:

250 large specimens	$100 00
150 " "	50 00
115 " "	25 00
100 smaller, in trays	10 00
65 do	5 00
Gold and Silver Ores, 15 specimens	10 00
Copper Ores, 15 specimens	2 50
Ores of Common Metals, 25 specimens	5 00
" " " 25 " smaller	2 50
Ores of Rarer Metals, 15 specimens	3 50
10 Miscellaneous Crystals	2 00
Chalcedony Geode, new, and unique	25

Polished specimens of all kinds, sizes and prices.

Ancient Stone Relics; Fossils; Agate, Pyrites and Aluminum goods.

Priced Catalogue for stamp.

Black Hills

Natural History Establishment,

Deadwood, S. D.

ESTABLISHED 1884.

P. S.—Catalogue tells you how to get goods on selection. You suit your taste by seeing before buying.

Mounted Specimens at a Bargain!

All specimens are strictly first-class, mounted on walnut perches.

Widgeon	$2 25	Shrew Mole	1 00	Pin-tail Duck, in wall case	5 00
Shoveler	2 25	Brown Bat	75	Ermine, in wall case	3 50
Cinnamon Teal	2 15	Golden Plover	1 75	American Osprey	3 50
Wood Duck	2 00	Chachalaca	3 00	Short-eared Owl	2 00
Sora Rail	1 25	White-tailed Kite	3 00	Barred Owl	2 00
Bartramian Sandpiper	1 75	Sharp-shinned Hawk	1 75	Screech Owl	1 50
Gray Fox	6 00	Nighthawk	1 25	Great Horned Owl	3 25
Red Fox	8 00	Arkansas Kingbird	1 25	Saw-whet Owl	1 75
Raccoon	4 00	Stellar's Jay	2 00	Burrowing Owl	1 75
Weasel	2 25	Oregon Jay	2 50	Scaup Duck, in wall case	5 00
Ermine	2 75	American Crow	2 00	Mountain Lion	25 00

SKINS.

Holboel's Grebe	$ 75	Black Duck	$1 00	Redpoll	$ 15
Pied-billed Grebe	60	Peacock	3 50	Blue-winged Teal	50
American Herring Gull	75	Wilson's Snipe	40	Shoveller	1 00
Red-breasted Merganser	1 00	Great Yellow-legs	60	G't Blue Heron, fall plum.	1 25
Sharp-shinned Hawk	50	Marsh Hawk	65	" " spr'g "	3 00
Goshawk	1 25	Sparrow Hawk	25	Screech Owl	50
Hairy Woodpecker	20	Short-eared Owl	75	Meadowlark	20
Rusty Blackbird	20	Stellar's Jay	75	Snowflake	15

ROUGH SKELETONS.

Red Fox	$2 00	Great Blue Heron	$ 75	Muskrat	$ 35
Red Squirrel	20	Mink	50	Parrot	40
Screech Owl	25	Brown Bat	25	Northern Shrike	25
		Horned Lark	20		

We have just issued our new price list of **Bird Skins, Mounted Birds** and **Mammals**, and **Custom Work in Taxidermy.** Send for a copy.

RAW FURS BOUGHT IN SEASON.

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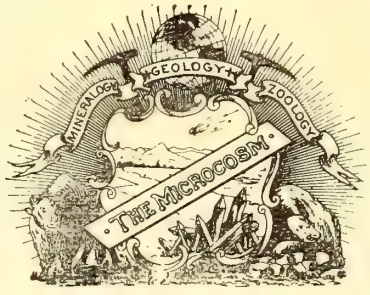
PRACTICAL TAXIDERMIST, BROCKPORT, N. Y.



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Washington School Collections.

Minerals, Rocks and Invertebrate Animals.

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

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The Archæologist.

INCORPORATED COMPANY.

AN ILLUSTRATED MONTHLY MAGAZINE, DEVOTED TO

ARCHÆOLOGY, ETHNOLOGY, HISTORY, AND GENERAL ANTHROPOLOGY

This will please Collectors.

Subscription, $1.00 per year. Sample copies free.

W. K. Moorehead, Editor.

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BOX 502, COLUMBUS, O.

HERKIMER CO. CRYSTALS.

Exhibit at World's Fair Received Highest Award

30 of the Famous Gems post-paid, only 72c

FREE! Every purchaser of this popular collection will be presented with a handsome glass tube containing 10 Microscopic Crystals, absolutely perfect, and so very small that it takes 11 000 to weigh one ounce. Your money will be cheerfully refunded if not satisfactory. Order today.

A. B. CRIM, Middleville, Herkimer Co., N. Y.

Lacertilia.

Phrynosoma cornutum	$ 40
Anolis principalis	30
Sceloporus undulatus	25
Sceloporus consobrinus	40
Sceloporus biseriatus	40
Sceloporus occidentalis	40
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Sceloporus jarrovii	75
Holbrookia lacerata	40
Verticaria beldingi	2 00
Cnemidophorus gularis	40
Cnemidophorus sexlineatus	25
Eumeces fasciatus	25
Oligosoma laterale	25
Uta ornata	50
Uta stansburiana	50
Xantusia vigilis	2 00

All above on hand in alcohol.

H. H. & C. S. BRIMLEY,

Collectors, Dealers and Taxidermists,

RALEIGH, N. C.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Natural Science News.

VOL. I. No. 10. ALBION, N. Y., APRIL 6, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

CONE IN CONE.—I will give a good specimen of cone in cone, for each old cent, or perfect arrow point with locality sent me. E. J. GARLOCK, 1602 W. 20 St., Des Moines, Iowa.

A FIRST CLASS skin of male Shoveler Duck and Mexican Raven and single eggs to exchange for common eastern skins. WM. J. ROLFE, San Bernardino, Calif.

DO YOU want pets? If so make offers on two Great Horned Owls in fine condition. Want climbers or eggs in sets. Will sell. JOE H. ANNFIELD, Jamestown, N. C.

WANTED.—Animal and Reptile skins. Send your list at once. H. MYERS, 611 Halsey St., Brooklyn, N. Y.

FOR CASH ONLY. Six 50 cent U. S. postal currency in one sheet (uncut but folded), first issue of July 17, 1862. For best offer. J. L. DAVISON, 55 Waterman St., Lockport, N. Y.

$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

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WANTED.—Numbers of *Nidiologist* and OOLOGIST. Will allow ten cents in exchange for each copy sent me. All letters answered. L. M. CLARK, Suffield, Ct.

EXCHANGE.—For first-class singles a "World" Stamp Album, clean, new, and containing 169 stamps. No duplicates. Worth over $1. H. F. EASTER, Sewanee, Tenn.

WANTED—A second hand copy of "Taxidermy and Zoological Collecting" by Wm. F. Hornaday. Send card, state condition and price wanted. Address CHAS. H. FINNE, Box 280, Little Rock, Arkansas.

EXCHANGE.—Album of Mexican stamps, 180 varieties, fine condition. History of Gen. Grant, etc., for singles, side blown Ducks, Hawks, Owls, Plovers from Middle States only, data desired. R. D. WAINWRIGHT, Stapleton, Staten Island, New York.

I HAVE an extra fine 6c Rev. Proprietary stamp to sell or exchange for best offer, also about 2,000 other U. S. Revenue stamps for sale or trade. A. W. THOMPSON, Preston, Minn.

FOR SALE at low prices. About 250 Bird skins. Specimens first-class and well put up. Send for list. All letters answered. B. FRANK WOOD, Winterburn, Penn.

WANTED.—Medical Books, Microscope, Surgical and Dissecting Instruments, High Grade Landscape lense, shutter and other photographic goods. Write at once to A. MOWBRAY SEMPLE, 140 Ashland Boulevard, Chicago, Ill.

TO EXCHANGE.—1000 fine stamps, some catalogued at over 15c, for best offer in eggs, singles. Send your eggs and I will send stamps. WALTER E. McLAIN, New Vineyard, Maine.

LIVE Specimens of *Anolis principalis*, Southern Chameleon at 75c dozen, prepaid. Southern Lepidoptera and Live Chameleons for eggs, H. B. BLAKEMORE, 1310 St. Andrew St., New Orleans, La.

SEND twenty-five cents, stamps will do, and get five bird skins, postpaid. E. S. MACGOWAN, 137 Western Ave., N., St. Paul, Minn.

THE ALL Steel Climber. Cant be beat. Climb any tree. Manufactured from the toughest steel and will not break. Price with strong straps, $1 50; without straps, 80 cents. Address R. C. ALEXANDER, Plymouth, Mich.

WANTED.—Cinnamon Teal in pairs, freshly skinned, for mounting; by post. Males in full plumage. State price. JAMES H. FLEMING, 358 Yonge St., Toronto, Ontario.

WANTED.—All the names of amateur egg collectors outside of New York state, also stamp dealers and collectors names wanted. Address EDWARD STREETER, Box 82, Chatham, N. Y.

THIS SEASON I will collect eggs in sets, botanical specimens, lepidoptera and marine curiosities at reasonable rates. Letters of inquiry must enclose stamp. ORA W. KNIGHT, 157 Hammond St., Bangor, Maine.

FOR SALE.—Maynard's Birds of Eastern North America With all the colored plates; bound in half Genuine Turkish Morrocco, gilt edges and ornamentation, a beautiful volume and scarce. Price $15. W. L. DUNBAR, 11 White St., Bridgeport, Ct.

BOOKS! BOOKS! Several volumes of works on Science, set of Waverly; A 1 revolver, climbers strapped. Will exchange for shells or sets of eggs. J. P. W. BROUSE, Mason City, Ills.

FOR SALE CHEAP.—I have recently purchased a collection of over 1200 eggs, 150 different kinds and over $130 worth. I will sell for the best offer in cash Also I have a pair of ready strapped climbers that I bought from "Lattin" last season, good as new. They cost $2.50 and the cabinet is worth $4. 300 new data blanks purchased this season and case with instruments. All shall go together to the one that gives the most, Any one desiring such a collection please write for full list of my eggs in sets, some few singles, all with complete data and are first class and original sets. ORLANDO S. SHEPPARD, JR., Edgefield, S. C.

CYCLOPEDIAS.—Since my last notice in the N. S. N. I have had such a call for the Cyclopedia of Naturaal History that I could not supply the demand. I have now an ample supply at very low rates. They contain 1,000 pages, 2,000 illustrations, nouparell type, strictly scientific. The set in 2 vols. half morocco, $1.75, postpaid $2: cloth 2 vols, $1.25, postpaid $1 50; strong manilla in 6 vols. $1, postpaid, $1.25. Specimen pages for stamp. L. V. CASE, Geneseo, N. Y.

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

WANTED.—A bicycle lamp, pair nickeled trouser guards, and a good double action revolver. 32 cal. Can offer American and Foreign birds eggs sets or singles. W. J. WIRT, Box 137, Gaines, Orleans Co., N. Y.

TO EXCHANGE.—Two years, 1893-'94 of *Scientific American*, and also *supplement*, same year. Cost of subscription, $16. Will exchange the lot for the best offer in first class skins, eggs or anything of value. All *bona fide* offers answered. MORRIS GIBBS, Kalamazoo, Mich.

EXCHANGE.—Marine shells for same, foreign stamps for same, herbarium specimens for same. Wanted *Wide Awake* magazines, Dec. '92-'93. Write, MRS. T. E. RUGGLES, Milton, Mass.

FOR EXCHANGE.—A Winchester repeating rifle, 22 calibre, model 1890, in good condition. Will exchange for American sets with carefully prepared data or mounted birds. Make offers immediately. JOHN W. DANIEL, JR., Lynchburg, Va.

FOR SALE.—620 1-2, 627 1-3, 743a1 5, 552 1-5, 725 1-5, 53 1-3, 337 1-2. For best cash offer over $3.25. Must sell at once. Write quick. FREDERICK HILL, Lyme, Conn.

WANTED.—Smoky Topaz Xtals and Western minerals for opals, garnets, rough and polished, and New England minerals. Send samples and prices. Send 10 cts. stamps for cash lists and specimens. ROBERT BURNHAM, Dennis, Mass.

ELK FOR SALE.—Herd of 10 Elk, all ages, six does, four bucks, three with antlers. Herd $800, or will sell trios. Write business. WILL C. HALL, Creston, Ia.

WANTED.—A good collecting pistol. Will give fine sets Columbian stamps, etc. Give full description. EDW. F. WATSON, Kennebunk Beach, Maine. 10-2t

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When answering advertisements always mention the NATURAL SCIENCE NEWS.

TO EXCHANGE.—Fine sets of the Roseate, Arctic and Common Tern; western sets especially desired. All live collectors send list and get mine. CHARLES C. PURDUM, Woods Holl, Mass.

FOR EVERY 100 one cent Columbians sent me, I will send 25 cents in singles. For 100 twos will send 15 cents in singles. Want other values. A. N. ESTES, La Vergne, Tenn.

WANTED.—A steam engine about ½ or 1 horse power, either horizontal or upright, will give in exchange minerals or electrical apparatuses or both, value $10. 3 acid batteries, 1 salamanac battery cylinder machine, inductive coil, motor, spark coil, guysler tube, 6 candle and 2 candle light, silver plating outfit. KARL KELSEY, Chestnut Hill, Phila., Pa.

WANTED.—An 8x10 rectilinear photo lens. I have two New Mail bicycles, fine 10x12 view lens in exchange, or will give part cash. A. S. McKEEN, Phillips, Maine.

CASH for a 5x7 or 5x8 Camera with good lense, improved shuttle, and complete outfit. All must be in first-class condition. Write quick. Will accept the best offer. Fine sets for No. 7 Egg Measure—Lattin's. GEO. GRAHAM, P. O. Drawer C. Gainesville, Fla.

FOR SALE.—Navajo blankets, Mexican pottery, opals and curios. Write for prices. CLIFF HALE, Phœnix, Arizona. 9w4

WANTED.—A Winchester repeating shot gun, model '93. Can give in exchange a Winchester repeating rifle and Indian relics, minerals and birds' eggs. GEO. W. DIXON, Watertown, S. D.

FOR EXCHANGE.—Camera 4x5 tripod, two rubber trays and printing frame, fair condition, value $7.00, for bird skins, minerals or curiosities, etc. RICHARD McMURTRIE, East Coulter St., Germantown, Phila. 8 w2

"PSEUDOMORPHS of Limonite after Pyrite" perfect cubes, elegant specimens. Will send prepaid at following low rates: Single specimen 10c, 3 for 25c, 12 assorted sizes for 75c. W. R. GRAY, Oakton, Va.

In the last seven years I have advertised my process of embalming in twenty-seven papers and magazines. For the number of replies and direct returns, your NATURAL SCIENCE NEWS advertisement eclipses all previous seasons, and discounts all other amateur local and general attempts. Respectfully Yours, MORRIS GIBBS, M. D., Kalamazoo, Mich.

EXCHANGE.—A large number of stamps of various countries, such as France, Germany, Switzerland, Belgium, Norway, Sweden, Denmark, ect., in exchange for *Confederate* or *Columbian* stamps. H. D. ACKERLY, 2 Ave. de la Gare, Lansaune, Switzerland. N.

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N. Y. tf

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FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

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Got a Shot Gun? I want a new Baker hammerless, Damascus steel barrels; or a Winchester Repeater, model of 1893. Want to give fine Minerals, Fossils or Indian Relics in exchange. Write me. L. W. STILWELL, Deadwood, S. D. tf

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Had many replies to my other little ad. I had to get an extra clerk to answer letters. ROBT. BURNHAM, Dennis, Mass.

The "Home in Florida" notice in No. 4 NATURAL SCIENCE NEWS brought four letters of enquiry and may lead to sales. GEO. PINE, Gulf Key, Fla.

MY AD. in the NATURAL SCIENCE NEWS paid me wonderfully. L. M. CLARK, Suffield, Conn.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

60 cents worth in value **FREE**

if you collect

BIRDS' EGGS.

Mention NATURAL SCIENCE NEWS and send 2c stamp for illustrated catalogue.

No. 0 Egg Drill	15c
" 1 " "	25c
" 2 " "	35c
" 3 " "	50c
" 4 " "	60c
" 5 " "	80c
" 6 " "	$1
Blowpipes	15 and 25c
Hand Egg Blower, very best	$1.60
Embryo Hooks	10 and 20c
Data Blanks per 100	15, 20 and 25c
Climbing Irons, best made, prepaid	$3
Scalpel with Brain Spoon	60c
Scalpel, ebony handles	60c
Calipers for measuring eggs	$1
Artificial Leaves, 6 kinds, ass'ted, per gross	60c

"Our Pet" Mineral Collection,

of 52 specimens all named, such as usually sell for 5 and 10c each, we will send prepaid for ONLY $1.00.

CHAS. K. REED,

TAXIDERMIST,

And Dealer in Naturalists' Supplies, Curiosities, Shells. etc.

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Mch. WORCESTER, MASS.

Just try these

Series of Minerals. You will be delighted with them.

Scale of Hardness, 9 specimens	$1 00
Color Collection, 25 "	6 00
Blowpipe " 25 "	1 00
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ESTABLISHED 1884.

P. S.—Catalogue tells you how to get goods on selection. You suit your taste by seeing before buying.

An Easter 'Snap'

This "Snap" will hold good until May 15th and will never be repeated.

If you will send me an order for Instruments, Supplies, Publications or anything I may have in stock, in the Specimen or Curio line, to the amount of $10.00 or over, between now and May 15th, and add $2.34 to your order, I will send you prepaid, a copy of

Davie's "Methods in the Art of Taxidermy."

This is that new and magnificent work on Taxidermy, published at $10.00 and If "Lattin" sells at $7.50. It's the book which many dealers advertise and say "Write for price," or "Price on application"—you see they have a lot of them on hand and wanted to get out from under before "Lattin" made this offer. (?)

If you tried any of these "write for price" dealers and offered them anything over 5.00, you doubtless got your book. Hundreds of copies have been sold for $5.00 and upwar 's, but I never heard of a new copy being sold for less than that amount. Hence if YOU accept my offer and desire a copy you will be securing one for

ONLY $2.34 PREPAID.

Truly an "unheard of price."

Faithfully,

Albion, N. Y. FRANK H. LATTIN.

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

I received reply after reply to my ad. in the NATURAL SCIENCE NEWS. FRED E. POMEROY, Lewiston, Me.

I received many answers to my card and it is a valuable advertising paper. L. L. LEWIS, Copenhagen, N. Y.

In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

I have received enough replies from my first notice to convince me that NATURAL SCIENCE NEWS is a first-class advertising medium. R. C. ALEXANDER, Plymouth, Mich.

From a little 35 cent adv. on this page in NATURAL SCIENCE NEWS of Feb. 9th Mr. Henry Clark of Gaines, N. Y., received cash orders for $15.50 worth of Ferrets.

I have received many answers to my advertisements and think, as an advertising medium, your NATURAL SCIENCE NEWS is unequalled. Wishing you success with your paper, GUY K. BARNES, Strawberry Point, Iowa.

HAVE been receiving very satisfactory replies from my notice in the NATURAL SCIENCE NEWS. W. J. B. WILLIAMS, Holland Patent, N. Y.

R-I-P-A-N-S

ONE GIVES RELIEF.

BIRDS Skins, Eggs, Stamps, etc., at lowest rates, 12 var, bird's skins, $1 Mounted birds, 50c. List free. F. T. CORLESS, Los Gatos, Calif. 6-12t

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

The Archælogist.

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FREE! Every purchaser of this popular collection will be presented with a handsome glass tube containing 10 Microscopic Crystals, absolutely perfect, and so very small that it takes 11,000 to weigh one ounce. Your money will be cheerfully refunded if not satisfactory. Order today.

A. B. CRIM, Middleville, Herkimer Co., N. Y.

Natural Science News.

VOL. I ALBION, N. Y., APRIL 6, 1895. No. 10

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN, Albion, Orleans Co., N. Y.

Coco, Coca, Cocoa, Cacao.

There are many commodities with which we are daily brought in contact, that are unknown to the large majority of our population, as relating to their production. There are also many others which are just enough understood or misunderstood to cause much confusion both as to names and qualities. This unfortunate condition arises from the improper naming of various commercial products, which are only known to us by common names, generally of our own coinage.

Of the many errors into which Americans have fallen, perhaps the most common yet least sensible one in the understanding and naming of foreign staples, is the improper acceptation of the words Coco, Coca, Cocoa and Cacao—words, which though correct enough perhaps, are so little understood in their true sense, that the large majority of Americans have inextricably mixed them. Most persons think that the above four words are directly an outcome of the one word Cocoa and fully think that chocolate and Cocoa are products of cocoanuts. Whereas the commercial chocolate is in no way a product of the coco-nut palm.

We read in foreign travels and observations, from various parts of the tropics that the food of the inhabitants is principally Cocoa, and this kind of information is nearly always misleading, as the names Coco and Cocoa are variously used to describe several different forms of food, and in different countries.

Coco comes from *cocos*, a Greek word meaning kernel and is the generic name of the nut-bearing palms, The scientific name *cocos* remains in botanies, but the corruption Coco is now seldom used and in its stead Cocoa has grown in favor for the nut-tree. The cocoanut tree is a tropical species, but is planted extensively in suitable quarters in sub-tropical latitudes. It has been imported to the Florida coast where it thrives with luxuriance at the present time.

The name Cocoa is also, and improperly, applied to the chocolate shrub of Central America, and from a generally poor understanding, it is popularly supposed that chocolate and the popular Cocoa are prepared from the cocoa-nut palm. Cocoa, or more properly Cacao, and chocolate are prepared from the seeds of *Theobroma cacao*, a species indigenous to Mexico and Central America. It is now extensively cultivated in South America.

The various preparations of Coca, among which Cocaine is well known as a local anæsthetic, come from a small tree which grows on the eastern Andean slope. This species is called scientifically *Coca erythroxylon*. The natives chew the green leaves and thereby secure a renewal of strength, which often enables them to perform prodigies of labor. It has however been shown that the ultimate effect is bad, as with all other powerful nervines and stimulants, when continuously used.

MORRIS GIBBS.

"Holed."

In this western country where the Jack Rabbit is found, it is commonly believed to be impossible to run one into a hole or shelter of any kind, or as the ranchmen say "They can't be treed."

This was proven to me to be a mistake during a recent hunt after a Bald Eagle. The Eagle had been seen about a small lake several times, but always out of gun range.

One morning I saddled a horse, thinking that I might approach close enough for a shot on horseback. I reached the lake and found the Eagle, as usual, watching for water fowl. I tried to approach, but it flew and then circled about just out of gun range. Just then my horse almost stepped on a Jack Rabbit in the grass. It started off giving me a fine shot, but I was hunting Eagles. It had gone but a short distance when the Eagle saw it and gave chase. Then followed the most interesting chase I ever witnessed. The rabbit ran with the swiftness that only a "Jack" can run, then turned this way and that and finally ran almost under my horse, only to be be followed by the Eagle.

Thus I was given several good shots but was so interested that I forgot about hunting Eagles.

Finally the rabbit seeing it could neither dodge nor outrun its pursuer made for a ranchman's house on the north shore of the lake, and ran under this building, The house floor is about one foot above ground and is boarded up excepting a small hole left for the accommodation of the dog.

After the rabbit had run under the house and the Eagle had flown to his perch on a telegraph pole, to resume his watch for ducks, I rode home wondering why I did not kill them both.

CHAS. BARBER.
Hall's Peak, N. Mex.

Nesting of Cathartes aura (LINN) in Oregon.

For the NATURAL SCIENCE NEWS.

For several years it had been reported to me that a pair of these Vultures had a nesting site, some six miles from this place (Sodaville) back in the mountains, but it was not until last May that I had the opportunity of visiting their retreat. A district schoolhouse was located some half mile from their nest, and the small boys in their wanderings, had accidentally found the nest and as they were aware of my desires in the Oological line, and with the expectation of making 50 cents (in which they were not disappointed) they reported their find to me.

On May 4th I started on my long and hard tramp, taking one of the boys with me, we soon came to the

foot of one of the higher hills, and the country soon developed into a very rocky aspect. As we advanced large boulders began to present themselves, some as large as an ordinary house.

On reaching the top of the hill, the boy said we were close by, and pointing to a large rock, said it was just back of that. Going around the rock we came upon the nest, and the bird flew off a short distance and perched upon the rocks, watched us as we proceeded to take as beautiful a set of two eggs, as I ever saw. The nest was nothing but a hollow between two small boulders, and the eggs rested upon a small bunch of moss.

Strewn about were many bones and this pair had probably been nesting here for several years.

The eggs were of a creamy white color heavily blotched with brown and were but slightly incubated. Average size 2.81x1.90.

A. G. Prill. M. D.

Late Arrival of Our Birds.

Perhaps nothing so far in 1895 has developed more of interest to the observer of birds and bird ways than the unusually late arrival of *all* of our must common birds, which are very generally quite accurate as regards the date on which they seek their summer homes or pass us on their way still further North. A few notes in comparison will do equally well in explanation and save your readers the perusal of a longer article.

	1891.				1895.	
Canada Goose,	first	seen	March	1.	March	27.
Robin,	"	"	"	3.	"	11.
Bluebird.	"	"	"	3.	"	28.
Phœbe,	"	"	"	3.	"	23.
Meadowlark,	"	"	"	4.	"	27.
Killdeer,	"	"	"	4.	"	23
R.-win'd Bl'kb'd	"	"	"	4.	"	21.
Bronzed Grackle	"	"	"	5.	"	17.
Marsh Hawk.	"	"	"	5.	"	23.
Song Sparrow.	"	"	"	8.	"	24.

I find that the notes of '94 are not far from the average for a period of some years. Have our birds forsaken us? I have noted only thirteen species thus far and I am noted as being very diligent in my efforts to personally welcome the first arrivals in every species possible. Let us hear from others of our fraternal brotherhood.

L. Whitney Watkins.
Manchester, Mich.

Black and Turkey Vultures.

In response to Mr. Eugene Pericles' request in Natural Science News of Feb'y 9th, for information concerning our Vultures. I will venture to give my observations, relative to their habits here in the Carolinas.

In extreme parts of western North Carolina, the Black Vulture is never seen; while in a more central portion of the state they are an occasional visitor, but are only seen in company with the Turkey Vulture, when feeding on some dead animal. The Turkey Vulture is very abundant throughout the state; while on the other hand, in the state of South Carolina, the Black Vulture by far exceeds the Turkey Vulture in number, and the nearer the coast the more plentiful you find them.

I have never observed a mixed flock of these birds flying together, although I have oftentimes seen them feeding together in apparent harmony. I am rather under the impression, that with these Vultures, majority rules, (so to speak) and where the Black Vulture is predominant in a section of country, the Turkey Vulture (as Mr. Pericles terms it) is driven away, and vice-versa.

J. S. Burgin,
Blacksburg. S. C.

What is Science?

For the Natural Science News.

There are so many vocations, or occupations in life followed by persons of great general ignorance: but, by a sort of complimentary ridicule are called Professor or some such term, that one half of the people who bear the title, wear it more in ridicule than in honor. So that some brute of a bully who approaches the physical power of a mule is called—Scienced. And, some one skilled in jugglery and deception is styled Prof.

The Natural Sciences too have their comprehension, which is quite distinct from the Mathematical Sciences.

Your little sheet, proposes the consideration of the Natural; and so far as subjects have been discussed in your pages that class has been handled.

While the pages are too small to expect any extended discussion of Natural Science, yet, there will be given to the public much of scientific interest. Zoology including Ornithology etc., etc., is a scienceand its expounders are true scientists, but, I think many people are mercenary in their conception of it;for instance—the trafficking in cabinet specimens. Not to get a cabinet of the preserved specimens of Natural History, but to put a few dollars in the pocket of him who prepared them for market. And cabinets of blown eggs are not prepared for the scientific study of the Oology, but to trade on something of mercenary value, really thus prostituting the science of Oology to sharp dealing.

And, annually thousands of birds, and their eggs are destroyed by nest robbers in the name of science, but, in the interest of a mere business occupation. So, with an other class of destroyers who kill birds for the feathers to sell to trim out womens hats and bonnets. Thus in the name of Ornithology the natural scavengers of the field and forest are diverted—from the true object of their creation to a purpose which has caused millions of bushels of grain, and millions of bushels of fruit, annually, to be destroyed by noxious insects which the birds would destroy if they were not destroyed in the name of a very creditable science.

What a science is, therefore, is, not, what it is taken to be. What I had hoped from your News, and what I believe it will advocate is, a a high plane of scientific teaching Nature, for the excellency of inculcating the scientific knowledge of what there is of beauty and learning. In bird-life, shell-life or mineral existance. What there is to the collection in money should be incidental, and not primary as now, in the collectors of the country

Ordinarily, the study of any Natural Science is in the field, and, by the collector himself, the proof of what he is studying consists, in demonstrating truth, indeed, nothing should be accepted as science that cannot be demonstrated as a truth, invariably occuring under like circumstances. If people would require such rigidity in test, how many of the so-called sciences would fail in the crucible of truth. How much of Geology would be left out of the books, if known truth should be required to demonstrate it, instead of speculation on which so much of it is based, so with astronomy, and, all the intangible subjects of scientific research. That Natural Science which falls most closely under your advocacy is, however, tangible and demonstratable; and, need not for that reason be prostituted to the avarice of mere business

pursuits: but should be studied for the love of knowing the truth.

To acquire a museum or cabinet, for the knowledge and pleasure of knowing the valuable minerals as we pass them by, in our hurry through life, is an honorable object, and, if we can only procure them by purchase it is right for some one to have them to sell, to us, —so for stuffed birds, and, of eggs or shells, or insects, but he who is his own collector will be most proficient in the science involved—whatever it may be.

What I urge therefore by all true scientists is, that in the study of their subject, and especially when animate subjects are required that no more life be sacrificed than is necessary to demonstrate the subject;and that the mercenary and his methods be discarded by the writers on all tropics in the NEWS.

V. M. FIROR.
Charlestown, W. Va.

Something Curious about the Crimson-spotted Triton.

The Newt, Eft or Crimson-spotted Triton (*Notophthalmus viridescens* RAFINCSQUE)—which by the way, so far as my observation goes, is found much more frequent on land than in water—is an apparently both offenseless and defenseless creature.

But by accident I discovered that it was provided with some weapon which, though invisible, was none the less effective, at least in the direction in which I saw it applied.

I had several garter-snakes, the largest but little over two feet long confined in a glass case in order to study their method of swallowing, I gave them some frogs and tree-frogs, and having some tritons, I put several of the little fellows which were two and one-half inches long, into the case. A snake promptly sized one and began swallowing it. It was quite an easy job, tbe triton being so slender, and was progressing nicely when the snake suddenly showed signs of considerable agony, and ejected the half swallowed triton as quickly as his back-set teeth would permit. After he had spit the newt out he kept opening his mouth as if he had got some hot acid in it. But he was hungry, having fasted for a time, so when I introduced a larger triton he captured it forthwith. This one he got further down than the other when he showed greater agony than before and fired it as quickly as possible. He writhed in agony kept opening his mouth now and then jabbing his head violently into the ground. He became so weak he could scarcely hold his head up, and when he did it swung from side to side as if he was drunk. It was nearly an hour before he revived fully. I fooled him a few times more after intervals, but at last he would not touch the triton any more. After that I left a number in the case, but so far as I could tell he did not offer to eat them. In this way I think I found that even a snake has memory.

As to the triton, I could not discover where its power lay. Of course it had no teeth capable of causing such a pain as the snake experienced and I witnessed. Any one who has ever examined any small salamanders know how frail their teeth are. And venom—they have not. The only thing I could think of was the possibility of those granular organs of the skin secreting some very acrid liquid, or at least, something very unpleasant to taste although that would necessitate some authentic development of the sense of taste in the snake;—a thing nobody would be in less hurry to grant than myself.

To get as near the truth of the matter as possible and be a hero in the cause of science, I resolved to taste a triton myself.—I tasted him, I have tasted both pleasanter and unpleasanter things to be sure, but I kept good hold on his tail.

His taste is about like his character, dull, flat, insipid; altogether rather tasteless. Maybe if I had had needle-like teeth and had drawn blood as the snake did, he would have exhibited more spirit. Be that as it may I had to leave the problem unsolved as I do here, an interesting one surely for further study.

ERNEST W. VICKERS,
Ellsworth, O.

Where to Hunt Lichens.

The following data are compiled chiefly from the Encycloyaedia Britannica, 9th Ed.

Lichens are never found on cultivated ground nor in atmosphere impregnated with smoke. They demand a quiet and exposed situation.

1. The rugged bark of old trees. (*Ramalina, Parmelia, Stictei.*)

2. The smooth bark of young trees and shrubs. (*Graphideus, Lecidea.*)

3. Trees by roadsides (Physcia) or in large forests. (*Usnea, Alectoria.*

4. Decayed wood of trees and old pales. *Calicieus, Lecidea, Xylographa.*

5. Calcareous and cretaceous rocks. (*Lecanora, Lecidea, Verruceria.*

6. The mortar of walls. (*Lecanora, Lecidea, Verracaria.*

7. On calcareous, peaty, and argillaceous soils, and on hardened mud. (*Cladonia, Lecidea, Lecanora, Collema, Peltidea.*

8. The sands of sea-shore and the granitic detritus of lofty mountains.

9. On decayed mosses and moss-like plants. (*Leptogium, Gomphillus.*)

10. Upon perennial leaves of certain trees and shrubs. (*Lecidea, Bouteillei, Strigula.*

11. On tombstones, old leather, iron and glass, on the bleached bones of reindeer and whales, on the dried excrements of sheep.

12. Parasitical upon other lichens. (*Lecidea, Pyrenocarpei.*)—*The Microscope.*

From the Sunny (?) South.

I saw the article in NATURAL SCIENCE NEWS about animal life during the cold snap. I add some facts, from my own observation, which you can publish if you wish.

On the 24th, of last month, I found six Bluebirds frozen in a hole in an apple-tree, and three on the ground beside the tree. About the same time I also found frozen, Swamp, White-throated, and Song Sparrows, and Slate-colored Juncos. Before that snow, Kinglets were very abundant, and now they seem to have disappeared; I haven't seen one since. Bluebirds have also been rare here since the unusually heavy snow of the 15th, ult,, which laid long on the ground.

J. ROWLAND NOWELL.
Anderson, S. C.
March 13th, '95

On March 5th ye Ed. recorded a most welcome "transient visitor", L. Whitney Watkins of Manchester, Mich. Brother W. is an ornithologist of the true type and one from whom we may well expect to hear in after years.

Pinon Jays.

Cyanocephalus cyanocephalus, arrived here early last fall and have remained with us all winter.

Large flocks could be seen passing over the city in early morn on their way to the fields where they fed on wheat and alfalfa seed.

They probably inhabit the high mountain regions of Colorado but I have never observed them on the plains before.

WILL BURNETT,
Fort Collins, Colo.

Natural History.

For NATURAL SCIENCE NEWS.

All the wonderous things of Nature—
Objects of the earth and sea—
Are engaged in ceaseless effort,
Writing out their history.

Monstrous planet, tiny pebble,
Grain of sand, whate'er it be—
Is a faithful, grave historian,
Writing tomes of history.

Rolling stones when dashing downward
O'er the mountain fast and free,
Leave their marks upon the granite—
Imprints of their history.

Dried-up brooklet, ancient river,
In their journeys to the sea,
Left behind them well worn channels—
Records of their history.

Oft we see a freak of Nature,
Which we call a mystery,
But a close investigation
Will unfold its history.

GEORGE J. REMSBURG.

List of Texas Mollusca, Land and Fresh Water.

Collected by J. D. Mitchell, Victoria, Texas.

Helix Alternata. SAY.
Colorado county and Victoria county.

Helix Berlandieriana, MOR.
Jackson and Victoria counties.

Helix Texasianus. MOR.
Jackson and Victoria counties.

Helix thyroides SAY.
Jackson and Victoria counties.

Polygyra (Mesodon) *thyroides.* SAY.
Victoria county.

Helices orbiculata. SAY.
Victoria county.

Glandina decussata. DESH.
Bexar county.

Planorbis trivolvis. SAY.
Lake, Jackson county, Spring creek and Traylor lake, Victoria county.

Bulimulus dealbatus. SAY.
Jackson and Victoria counties.

Bulimulus alternatus- SAY.
Jackson and Victoria counties.

Bulimulus schiedeanus. PFR.
Victoria county.

Succinea salleana. PFR.
Lake, Jackson county, Traylor's lake, Victoria county.

Physa gyrina. SAY.
Spring, near forks of Navidad and Lavaca rivers, Jackson county.

Physa heterostropha. Dwarf Var.
Water troughs at stock windmill, Jackson county.

Sphærium elevatum. PRIME.
Young and Bluet lakes, Jackson county.

Unio anodontoides. LEA.
In every lake and river that I collected in, both Jackson and Victoria counties. In Young lake, Jackson county, large and rugged; in Rupley lake, Victoria county, medium smooth and beautifully polished with no abrasions around the umbones; in Guadaloupe river rather small.

Unio aureus. LEA.
Guadaloupe river, Victoria county.

Unio aureus. Var. LEA.
Guadaloupe river.

Unio Berlandieri. LEA.
Coletto creek, Victoria county. The young are in two colors—yellow and brown.

Unio Berlandieri. Var. LEA.
Guadaloupe river.

Unio Coloradoensis. LEA.
Skull creek, Colorado county.

Unio Forsheyi. LEA.
Skull creek, Colorado county, near Altair.

Unio gracilis. BARNES.
Skull creek, Colorado county, near Altair.

Unio hydianus. LEA.
Spring creek and Manchoula lake, Victoria county.

Unio Linthecumi LEA.
I got this in Skull creek, Colorado county, near Altair.

Unio manubius. GOULD.
Lakes in Jackson county, lakes in Victoria. They are extre mely hardy. I have five specimens from small lake on Coletto near Warden,s ranch, taken from the water in June, 1893, and they are alive today, April 26, 1894.

Unio Mitchelli. (New.) SIMPSON.
Guadaloupe river, Victoria county, named by Mr C. T. Simpson of the U. S, National Museum.

Unio multiplicatus. LEA.
Guadaloupe river, Victoria county.

Unio nodiferus. CON.
Skull creek, Colorado county.

Unio perplicatus. CON.
Rupley lake, Victoria county.

Unio purpurastus. LAM.
Skull creek, Colorado county, near Altair.

Unio rotundatus. LAM.
Lakes in Jackson county, lakes in Victoria, Hog Bayou and Green Lake, Calhoun county. Slightly variable in shape and very variable in size.

Unio Rutersvillensis. LEA.
Young lake and Bluet lake, Jackson county; Spring creek, Victoria county.

Unio speciosus. LEA.
Mc Fadden lake, Rupley lake, Garcitas creek and Coletto creek, Victoria county.

Unio Tampecoensis. LEA.
Rupley lake, Victoria county.

Unio Texasensis. LEA.
I found this in every lake in Jackson and Victoria counties and in Coletto creek, Victoria county. There is a great diversity of color in the epidermis and some variation in outline and nacre.

Unio tuberculatus. Var. BARNES.
One in Rupley lake, pink nacre, one pink nacre and two white nacre, Guadaloupe river, Victoria county.

Unio undulatus. BARNES.
Manchoula lake, Guadaloupe river, Victoria county.

Anodonta corpulenta. COOPER.
Skull creek, Colorado county, near Altair,

Anodonta imbecilles. SAY-
Young lake, Jackson county, Manchoula lake, Victoria county.

Anodonta leonensis. LEA.
Manchoula lake, Rupley lake and Spring creek, Victoria county.

Anodonta Stewartiana. LEA.
Manchoula lake, Rupley lake, Mc Fadden's lake, Victoria county.

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Albion	6:50	7:00	9:00	11:35	3:25	6:50	11:06
Lockport		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo		6:35		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge		6:45	8:10	11:20	1:48		5:55
Lockport		7:30	8:50	12:00	2:25	5:55	6:35
Albion	7:05	8:20		1:00	3:25	6:45	7:55
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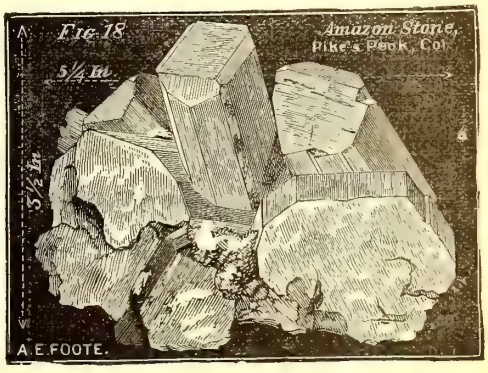

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No references are given because there are but few institutions in America that have not purchased of me and but few countries where I have no customers.

Many of the scientific men of the country recognizing the advantage of having such an exchange, have placed copies of their papers in my hands for sale on commission. Our lists of scientific books are sent free on light paper, except the 200 page Medical Catalogue, same price as the Mineral Catalogue. Heavy paper, see page of book abbreviations.

All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

When any book inquired for comes to hand, a memorandum, stating description and price will be sent. In our book catalogues the prices opposite the latest number supersede former prices usually where descriptions are the same. My arrangements for noting the needs of my correspondents are nearly perfect.

Over 300,000 pamphlets and papers, many uncatalogued, in stock. I will get what you order ultimately.

FINALLY AND OF THE MOST IMPORTANCE.—We must especially request our customers to let us know of all mistakes and errors that may occur at our establishment. We can and will gladly rectify them at our own expense.

Broken Bank Bills.

I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c.

J. E. HANDSHAW, Smithtown Branch, N. Y.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J. M. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Natural Science News.

ADVERTISING RATES.

Only 5c per norpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

100 lines	4½c	per line.
200 "	4	"
300 "	3½	"
500 "	3	"
1000 "	2½	"
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A column contains 120 lines; a page, 360.

A little two-line ad. would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

A small one inch ad. run one year would use 624 lines and would entitle the purchaser to the 3 cents per line rate, and cost only 36 cents per issue.

A 3¾ inch ad. run one year would use 2,028 lines and would entitle the purchaser to the 2 cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

NOW READY.

My April list of cheap single eggs. Send 2c stamp. My prices cannot be beaten. I have the stock and will not be undersold. When will dealers form a combine to keep prices uniform? Probably next fall. In the meantime, secure eggs at prices that will astonish you. 10 cents each buys such eggs as Mew Gull, Kittiwake, Franklin's, Royal Tern, Black Guillimot, Leach's Petrel, Cormorant, Brown Pelican, Wilson,s Plover, Corn Crake. 15 cents buys such eggs as Western Grebe, Californian Gull, Fulmar, American Egret, Marsh Hawk, etc. 25 cents each buys Caspian Terns, Stormy Petrel, Glossy Ibis, Swainson's, Rough-legged, and Harris's Hawk and other eggs. W. RAINE. Bleecker St., Toronto, Canada.

Special 60 Day Offers.

10	varieties perfect Indian Relics	$ 90
6	" " " "	50
12	" " " "	1 10
5	" " " "	25
20	" " " "	2 50
15	" curiosities	27
25	" "	50

Best of all! 1 Spear Head, 2 Arrow Heads, 1 War Point, 1 Knife, perfect, 35 cents. Every one of the above are perfect in every way sent by return mail, for 60 days only. Remit by money order. Price list free. Drawing and special prices of any goods you may need, 4 cents.

W. PERRY ARNOLD, Stonnington, Conn.
a&m

Bird Skins Cheap.

Below we name a few from our large stock. All first-class, with data and measurements.

Wood Duck, adult male, per skin		$2 00
Least Bittern,	"	1 00
King Rail,	"	1 00
American Woodcock,	"	75
Killdeer,	"	40
Screech Owl,	"	75
Horned Lark,	"	30
Prairie Horned Lark,	"	35
Bobolink,	"	20
Summer Tanager,	"	40
Cardinal,	"	25
Indigo Bunting,	"	20
Blue-headed Vireo,	"	25
Tree Swallow,	"	20

H. H. & C. S. BRIMLEY,

Natural History Collectors and Dealers,

RALEIGH, N. C.

Collectors and Taxidermists!

ATTENTION!

This is the season of the year when it is a pleasure to mount birds This is the time to learn to preserve birds for ornament.

If you are a thorough, practical Taxidermist, you do not need my method of mounting. But there are thousands of boys and girls as well as men and women, who are anxious to preserve objects of Natural History, yet who cannot afford to pay out $10.00 to $50.00 for a taxidermy and instruction, with the great uncertainty attending the success of the venture.

There are thousands in this country who do not care to take up taxidermy as a profession, yet who are inclined to try their hands at the agreeable work of mounting birds.

To these willing ones, we would recommend the process of

EMBALMING

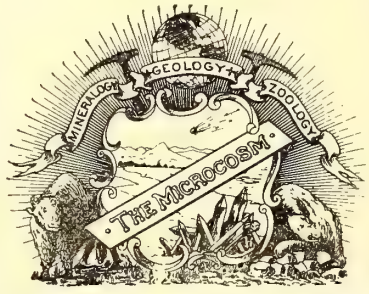
as a method easy to acquire and most satisfactory in its results. This process, with full instructions, and one pound of the prepared compound, ready for use—enough for 30 to 40 small birds will be sent on receipt of the price.

Absolutely no tools required, excepting knife and file. Any child can learn it in a single attempt. Less than one-third of the time required by skinning.

Price, 75 cents, cash or postage stamps.

Address, mentioning the NATURAL SCIENCE NEWS.

MORRIS GIBBS, M. D., Kalmazoo, Mich.



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FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals.

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C.

NOW READY.

My April Bargain List of Eggs of Birds of Prey, in first-class sets, original datas, mostly taken by our best known Oologists. Send two cent stamp for list. The prices will astonish you; but I must reduce my large stock before I leave here in June for North-West Canada. No decent offers refused. W. RAINE,

Toronto, Canada.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs,** including *Falco tinnunculus,* etc., etc.

HERMANN ROLLE,
INSTITUTION FOR NATURAL HISTORY,
Emdener-Str. 4, Berlin, N. W., Germany.

To Dealers and Collectors: Will furnish small Fossils, Shark's Teeth and Corkscrew Fossils from Stafford Co., Va., for $1.50 per 100. The fossils are something new and unique. GEORGE W. KIRTLEY, Fredericksburg, Va. Ao-10n-e3mo.

Camp Agassiz.

A summer home for boys, conducted by an experienced Naturalist. Good fishing and boating with plenty of Natural History work. For particulars address,

CHAS. B. WILSON,
JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

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CRYSTALS.

E. H. HARN, Collector.

If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large movable water drops as large as peas: **Kaolin; Clay,** different colors: **Wad; Chlorite; Micas; &c.**

Rutitated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Colinubite,** in piled groups of crystals: **Gem Amethyst; Rutile,** blood-red, single Crystals: **Hiddenite,** the best to be had but none very large: **Kyanite,** sky-blue Crystals: **Oclopedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare: **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address.

J. H. RUGG,

Box 262. **Blairsville, Pa.**

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Natural Science News.

VOL. I. No. 11. ALBION, N. Y., APRIL 13, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED.—No. 1 and 2, Vol. 1 Cassier's Magazine. Have Harper's, Scribner's, Century, Cosmopolitan and Outing from 1890. Good exchange, write for what you want. J. L. DAVISON, 55 Waterman St., Lockport. N. Y.

WANTED.—An 8x10 rectilinear photo lens. I have two New Mail bicycles, fine 10x12 view lens in exchange, or will give part cash. A. S. McKEEN, Phillips, Maine.

EXCHANGE.—Fine crinoidal stones and a variety of fossil coral from Lake Michigan to exchange for curios of any sort not already in my collection. Correspondence solicited. MRS. E. C. WISWALL, Kenosha, Wis.

TO EXCHANGE. Eggs in sets for hammerless shot gun in good condition. Those having gun to ex. please address, R. G. PHELPS, 532 Eleanor St., Kalamazoo, Mich.

A FINE Collection of stamps catalogued from $30 to $35 in new album, to exchange for first class printing press, type or microscope. G. W. BAILEY, London, West, Ontario.

WILL exchange a 32 calibre hammerless revolver (nearly new) for a fishing tackle box (place for two reels) and with lock or collection of stamps or single eggs not in my collection. *Former prefered.* J. K. AUMACK, Box 907, Ballston Spa., N. Y,

TO EXCHANGE.—Best of Steel Climbing Irons and egg drills, Bird Skins, sets and stamps for sets, relics and other goods. CLARENCE C. WATROUS, Chester, Conn.

NOTICE.—A few first class common skins and fine singles, with data, to exchange for first class skins, sets or Lepidoptera in papers. Send lists and receive mine. C. HOUGHTON, L. Box 297, Potsdam, N. Y.

BARGAIN.—E flat Cornet, highly burnished, good condition, $7.50. Wanted, books on Natural History, also Oct. and Dec. *Nidiologist*, 1893. C. F. STONE, Branchport, N. Y.

TO EXCHANGE.—Ornithologists' and Oologists' Manual, leather; Davie's Naturalists' Manual; The Living World, cloth; and Fossil Shells. For books on Ornithology, Mammalogy or Taxidermy or best offers. CHAS. F. SWAN, Abingdon, Ill.

WANTED, GUNS.—Two or three small collecting guns, for small bird collecting. Must be in first class order. Will give part cash, rare eggs or skins. W. RAINE, Toronto, Canada.

LOOK! Anybody who sends me 75 cents I will send a first class Great Blue Heron skin. JOHN RIEXINGER, Box 544, Holley, N. Y.

HAVE Annual Report of the Bureau of Ethnology, 1883-84 to exchange for "Birds of Kansas" or other books on ornithology and oology. A. J. McKAY, Lock Box 39, Girard, Kan.

WANTED.—I want cocoons of all the large moths. *Luna, Promothea, Cecronia, Atlas*, etc. ALEX. H. NOEL, Lacleda School, St. Louis, Mo.

WANTED.—Second copies of Coues' Key, Birds of Pa., Bulletin on Hawks and Owls of U. S. Parties having same please write. H. L. VANDEGRIFT, Ambler, Pa.

$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

☞ When answering advertisements always mention the NATURAL SCIENCE NEWS.

PARTS 1 to 8 inclusive of "Pugilists of America" to exchange for eggs, Columbian or U. S. stamps, cash or offers. FRED MALTBY, Olathe, Kansas.

AN "EDLAND" type writer, price $10 to exchange for A 1 skins or sets with full data, at ¾ catalogue prices. Send for circulars. J. F. ILLINGWORTH, Pomona College, Claremont, Calif.

EXCHANGE.—Bird skins for western and southern skins, send list and receive mine. MRS. A. L. NISSLEY, Box 20, Landisville, Pa.

TO EXCHANGE.—*Golden Hours* and second hand books for scientific books, papers, specimens or instruments. HOWARD HIXON, Washington, Pa.

EXCHANGE.—I have a limited number of choice Mexican opals to exchange for stamps or any offers of curios. All letters answered. WILL D. WALTMAN, 209 North Wahsatch Ave., Colo. Springs, Colo.

CONCHOLOGISTS attention! I am going to sell my collection of Long Island shells in lots for ten cents each. Twelve different species, twenty shells, in a lot. *Cardium mortone, Arca transversa*, etc. FRANK BAXTER, 109 East 17 St., New York, N. Y.

I HAVE 1500 small T perches. 3 inch base, oak fine finish 8c each; pine painted white at 6c each. Will take half cash and balance in exchange. I will turn any kind of T perches, round flat stands, bases for glass shades or anything in the line at a very low price. Write for price list. E. L. HALEY, Phillips, Maine.

CHEAP Sets and Singles. Have you seen my bargain list for April? If not send 2c stamp. I am offering Grebes, Loons, Petrels, Shearwaters, Gulls, Terns, Cormorants, Swans, Ducks, Geese, Plovers and Herons at prices that cannot be duplicated. I must clear out my stock of 8,000 duplicates before I leave for the North, 1st of June. I now offer over 1000 eggs of Birds of Prey, including Eagles, Duck Hawks, Buzzards, Owls, Mississippi Kites, Caracaras, &c. Dealers will find my prices low enough for them to buy from me to sell again. W. RAINE, Bleecker St., Toronto, Canada.

TO EXCHANGE.—Butterflies, moths, beetles of Missouri and Illinois for those of other states. Send list of what you have to offer and what you want in exchange. Also *European* butterflies. *Wanted* correspondence with Entomologists who will exchange specimens with me the coming season. J. BODENBURG, 523 Mo. Ave., East St. Louis, Ills.

½$10.00 World Typewriter, minerals, eggs in singles and books to exchange for 8 or 10 point Roman or Job Type. CLYDE L. SMITH, Oblong, Ill.

ELK FOR SALE.—Herd of 10 Elk, all ages, six does, four bucks, three with antlers. Herd $800, or will sell trios. Write business. WILL C. HALL, Creston, Ia.

WANTED.—A good collecting pistol. Will give fine sets Columbian stamps, etc. Give full description. EDW. F. WATSON, Kennebunk Beach, Maine. 10-2t

FOR SALE.—Navajo blankets, Mexican pottery, opals and curios. Write for prices. CLIFF HALE, Phœnix, Arizona. 9w4

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N. Y. tf

FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

Got a Shot Gun? I want a new Baker hammerless, Damascus steel barrels; or a Winchester Repeater, model of 1893. Want to give fine Minerals, Fossils or Indian Relics in exchange. Write me. L. W. STILWELL, Deadwood, S. D. tf

ARCTIC HORNED OWLS.—A few freshly made skins of this rare bird, worth full $6.00. We can supply a limited number of fresh skins of Old Squaw. In full summer plumage. Correspondence solicited. OLIVER SPANNER & CO., 358 Yonge St., Toronto Canada.

WANTED.—To correspond with collectors who can make up first-class Warbler skins and put good data on them. Can offer good skins and some sets. H. T. VAN OSTRAND, Polytechnic Inst., Worcester, Mass

TO EXCHANGE or For Sale.—My collection of eggs in sets, first-class specimens; includes rare Warblers, Whip-poor-will, etc. Catalogue value $60. Also first 10 vols. OOLOGIST, for a first-class collection of postage stamps. W. L. DUNBAR, 11 White St., Bridgeport, Ct.

FINE SKINS of Townsend's Junco, White-naped Nuthatch, Anabel's Bluebird and other rare birds to exchange for stamps. Three old Chinese coins for 10 Columbian stamps above 2c. Set eggs San Pedro Partridge for best offer in stamps. E. C. THURBER, Alhambra, Cal.

WANTED.—A 4¼x6½ or 5x8 camera in first class condition. Can offer in exchange mounted birds, bird skins, land and marine curios, shells, antlers, Indian relics, etc. A. H. VERRILL, New Haven, Conn.

NORTHERN Birds for Sale.—A limited number of very choice skins of Willow Ptarmigan @ $1.50; Gray Ruffed Grouse @ $1.50 and American Hawk Owl @ $2. All are '95 collecting with full data and are in extra fine condition. G.F. DIPPIE, 324 George St., Toronto, Ont.

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

I received over one hundred answers to my ad. in the N. S. N. and think it a splendid advertising medium. J. S. Noah, East Liverpool, Ohio.

I received reply after reply to my ad. in the NATURAL SCIENCE NEWS. FRED E. POMEROY, Lewiston, Me.

I received many answers to my card and it is a valuable advertising paper. L. L. LEWIS, Copenhagen, N. Y.

In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

I have received enough replies from my first notice to convince me that NATURAL SCIENCE NEWS is a first-class advertising medium. R. C. ALEXANDER, Plymouth, Mich.

From a little 35 cent adv. on this page in NATURAL SCIENCE NEWS of Feb. 9th Mr. Henry Clark of Gaines, N. Y., received cash orders for $15.50 worth of Ferrets.

I have received many answers to my advertisements and think, as an advertising medium, your NATURAL SCIENCE NEWS is unequalled. Wishing you success with your paper, GUY K. BARNES, Strawberry Point, Iowa.

HAVE been receiving very satisfactory replies from my notice in the NATURAL SCIENCE NEWS. W. J. B. WILLIAMS, Holland Patent, N. Y.

Had many replies to my other little ad. I had to get an extra clerk to answer letters. ROBT. BURNHAM, Dennis, Mass.

The "Home in Florida" notice in No. 4 NATURAL SCIENCE NEWS brought four letters of enquiry and may lead to sales. GEO. PINE, Gulf Key, Fla.

MY AD. in the NATURAL SCIENCE NEWS paid me wonderfully. L. M. CLARK, Suffield, Conn.

In the last seven years I have advertised my process of embalming in twenty-seven papers and magazines. For the number of replies and direct returns, your NATURAL SCIENCE NEWS advertisement eclipses all previous seasons, and discounts all other amateur local and general attempts. Respectfully Yours, MORRIS GIBBS, M. D., Kalamazoo, Mich.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

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This will please Collectors.

Subscription, $1.00 per year. Sample copies free.

W. K. Moorehead, Editor.

Address THE ARCHÆOLOGIST,
BOX 502, COLUMBUS, O.

BIRDS Skins, Eggs, Stamps, etc., at lowest rates, 12 var. bird's skins, $1 Mounted birds, 50c. List free. F. T. CORLESS, Los Gatos, Calif. 6-12t

Special 60 Day Offers.

10 varieties perfect Indian Relics		$ 90
6	" " " "	50
12	" " " "	1 10
5	" " " "	25
20	" " " "	2 50
15	" curiosities	27
25	" "	50

Best of all! 1 Spear Head, 2 Arrow Heads, 1 War Point, 1 Knife, perfect, 35 cents. Every one of the above are perfect in every way sent by return mail, for 60 days only. Remit by money order. Price list free. Drawing and special prices of any goods you may need, 4 cents.

W. PERRY ARNOLD, Stonnington, Conn.
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Just try these

Series of Minerals. You will be delighted with them.

Scale of Hardness,	9 specimens	$1 00
Color Collection,	25 "	6 00
Blowpipe "	25 "	1 00
Scale of Fusibility,	6 "	1 00
28 Microscopic mounts		6 50
12 different Cut Gems in Velvet Case		6 00

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for Schools and Museums, mounted on blocks and scientifically labeled and arranged according to Dana, viz:

250 large specimens	$100 00
150 " "	50 00
115 " "	25 00
100 smaller, in trays	10 00
65 do	5 00
Gold and Silver Ores, 15 specimens	10 00
Copper Ores, 15 specimens	2 50
Ores of Common Metals, 25 specimens	5 00
" " " 25 " smaller	2 50
Ores of Rarer Metals, 15 specimens	3 50
10 Miscellaneous Crystals	2 00
Chalcedony Geode, new, and unique	25

Polished specimens of all kinds, sizes and prices.

Ancient Stone Relics; Fossils; Agate, Pyrites and Aluminum goods.

Priced Catalogue for stamp.

Black Hills

Natural History Establishment,

Deadwood, S. D.

ESTABLISHED 1884.

P. S.—Catalogue tells you how to get goods on selection. You suit your taste by seeing before buying.

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Embalming! Mounting!

Artistic, Durable, Satisfactory!

Do you want to learn to mount birds in a lifelike and satisfactory manner?

Do you want a reliable method, and at a very reasonable figure?

Do you want a process of mounting which you can learn, in one lesson?

Then write for my process of Embalming, which is sure to please you.

The method, is embalming the body almost entire, and the resulting adjustment of the wings, head and legs is more satisfactory, and gives better results than from any other process in modern taxidermy, and is far superior to all other methods in this respect, because so easily understood.

If you are a first-class taxidermist, you do not need this method, for you have already spent years in learning the trade: however, you could learn a valuable lesson in the art of posing a bird, for this method is superior to all others in this respect.

But it is to the beginners that my process appeals.

There are thousands of boys and girls, as well as grown persons, who wish to mount specimens, yet who have no means of learning.

It costs from **ten to fifty dollars** to take a course of instruction from a competent teacher, in the art of taxidermy, and at those figures, the best points are not learned.

It takes from **$5.00** to **$10.00** to buy a good work on Taxidermy, and it is a well known fact that without assistance, few, very few, succeed.

If you purchase, this process, it will cost you **75 Cents** for one pound of the Compound, and the printed instructions.

One pound of the Embalming powder will fully prepare and preserve 40 to 50 small birds, and it is guaranteed to keep 20 birds the size of a robin, forever.

TESTIMONIALS.

Testimonials from boys are to be expected and I have hundreds of them: but I, also have over (200) letters of commendation from leading professional men, doctors, ministers, professors of first-class colleges, and even regular taxidermists have advocated and extolled my process; while parents, of children who were too young to write, have told of the success of this method, and which they have taught to their children.

A Few Testimonials.

Have found your process a success. Birds that I mounted look well. Am satisfied.
F. A. NORTON, Normal School, Ypsilanti, Mich.

Your process works well. I am thoroughly satisfied.
L. B. HARTZELL, Crystal Springs, Kas.

The instructions and embalming compound received. My son is making rapid progress for one so young. Is filling the house with mounted birds. D. F. STUCK, M. D.

DEAR SIR:—The process is a great success and gives me much pleasure. My little girl can mount birds in a life like manner after two weeks' practice, much to her delight. She is eleven years old. My boy of fourteen succeeded at the first attempt. Your method of shaping the body and wings is superior to all others. MRS. H. B. JOHNSON.

Swindles!

Counterfeits!!

Imitations!!!

There are many imitations of this process and they are all advertised as **just as good!**

The truth is, they are worthless productions: the preparations being composed of inert ingredients put up by irresponsible persons, while the directions are invariably merely garbled copies of my instructions.

The ingredients of my compound cost heavily, even at wholesale, but by purchasing largely, and by a superior process of mixing these poisons, there is a small profit if many orders are taken.

"$100.00 Reward!"

Many are unbelievers as to the efficacy of this compound, as they think it cannot preserve flesh.

One Hundred Dollars Reward

Will be paid to the person proving that one ounce of the compound will not preserve one-half pound of beefsteak, porksteak, mutton or fowl, forever. The meat can be hung in the sun immediately after it is prepared, and will never be infested with fly blows.

Will Meat Shrink?

Certainly it will! But by a method which is fully explained in the instructions, this shrinkage is easily, and fully compensated for in a simple manner, and the specimens require less attention than specimens mounted in other ways.

Specimens which I mounted by this method over twenty years ago, look well today and hold their freshness and shape much better than with birds mounted in traditional style (stuffed).

Questions answered fully if letters contain stamps.

Price of Instructions and one pound of Compound, enough for 20 to 40 small birds, 75 cents.

Fewer tools required than in any other method. Only a knife, file and wire required. The quickest method, and entirely satisfactory.

Address all letters to

Mention Natural Science News.

MORRIS GIBBS, M. D.,

KALAMAZOO, MICH.

Natural Science News.

VOL. I ALBION, N. Y., APRIL 13, 1895. No. 11

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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FRANK H. LATTIN,
Albion, Orleans Co., N. Y.

A copy of NATURAL SCIENCE NEWS is mailed to every subsbriber each week. Should you fail to receive your copy write for another one sending your correct address in full—thus enabling us to correct our books if they are at fault.

Collectors are on the *qui vive*—an unusually large number will seek new fields to conquer this season. The following are already in the Field:—N. C. Davis, Unita Co., Wyoming, R. C. Campbell, Maricopa Co., Arizona; E. S. Bryant and E. G. Mummery, Devil's Lake Region; and that veteran collector, Frank B. Armstrong, still remains in Mexico.

NATURAL SCIENCE NEWS had by actual count, on the morning of April 11th, one thousand and twenty-four (1024) *paid* subscribers. Of this number fully Eight hundred and fifty (850) are "pioneer" ones. These 1024 subscribers are distributed as follows:

Alabama	2	New Mexico	1
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Massachusetts	53	Wisconsin	29
Michigan	58	Wyoming	1
Minnesota	22	British Columbia	4
Mississippi	4	Manitoba	2
Missouri	20	New Brunswick	1
Montana	4	Ontario	27
Nebraska	12	Quebec	5
New Hampshire	13	Switzerland	1
New Jersey	23		1024

Hon. J. D. Mitchell writes us that he has recently added 18 species Marine; 29, Fresh Water; and 34, Land Shells to his collection of Texas Mollusca.

Many Naturalists will be doing Field work during the next few months and rather than have them miss the weekly visits of the NATURAL SCIENCE NEWS, we will gladly mail to them direct—if they will only keep us posted as to their whereabouts.

Automatic Bear Catching.

"Landing at Olutorsk, a little trading station on the northwest coast of Siberia, during my last trip to the Arctic," said Captain Avery of the whaleship Grampus to a New York Sun reporter, "some Chuckchee Indians from inland came in, bringing reindeer meat and peltries for sale. Among the skins they brought was a huge bearskin, which I tried to buy, but I could not agree with the owner as to the price. Through an interpreter I learned the curious way in which these Indians kill the bear. The Kamschatkan bear is a huge brown fellow, often weighing over 1,000 pounds, and is very ferocious and hard to kill. Such an animal is invulnerable to the small darts which are the Chuckchee's missile weapons, and it is necessary to cripple him before closing in with spears.

These bears inhabit ground which is covered with dense thickets, through which they have paths and runways. The latter are impenetrable to man, except he crawl on hands and knees. To circumvent the bear the Chuckchee takes two pieces of board about six inches long and three inches wide, through which he bores numerous holes. Through the holes in each piece he puts long iron nails, with their points sharpened. Then placing the backs of the pieces of the wood together he lashes them with thongs, thus leaving the sharp ends of the nails projecting on either side. This curious implement of hunting he lays in the runway where the bear tracks are thickest, lightly covering it from view.

"Presently the bear comes along his great forepaws each covering nearly a square foot of surface, and almost to a certainty he plants one fore paw upon the nails, which penetrate and hurt him. Rising upon his hind legs he raises the paw to which the boards are fastened by the nails, looks at it, and, seeing the thing that has hurt him, he strikes at it with his other paw to knock it off, thereby driving the nails from the side he hits into that paw.

"Thoroughly angry, he now hauls off and strikes with the first paw that was pierced and the nails again penetrate that. So he goes on striking with one paw and the other, driving the nails deeper and deeper into the flesh, until exhausted with pain and rage he sinks to the ground. His paws are now so sore that he cannot travel far and as far as he goes he leaves a trail of blood behind him. Discovering this the Indians follow him up, and with their spears dispatch him."

Curious Foods of the Fishes in the New York City Aquarium.

The work of providing suitable food for the many varities of foreign and domestic fish in the New York City Aquarium makes a very curious and interesting study. The food provided is as nearly as possible like the food the fish eats in its natural free state. The fish are fed once a day at a regular hour. The live food is placed in the tanks and is soon captured by the fish, and the dead food is thrown into the pools as required and the part not used is afterward taken out to keep the pool clean. It is found necessary to have as much variety as possible in fish foods, since the fish are very fastidious in their diet and often refuse to eat the food offered them.

The live food consists of clams, shrimp, killies, crabs, and a variety of small fish. Clams are used in large quantities, being cut up into sizes to suit the fish. For sharks and such large fish live menhaden are placed in the pools. The skate and the dog fish eat large snails, the stripped bass are fed on soft crabs. The smaller fish required especially prepared fish. If clams are fed them, for instance, they have to be cut up into mince meat or else carefully scraped. The sea anemone, for instance, are fed on crabs and the soft parts of oysters, and it is nec-

essary to place these particles of food on forks to place them within the anemone's reach. The sea horses are especially delicate feeders, and great care is taken in preparing their food. A minute crustacean is sometimes put in their tanks. Shrimps are also used at times for this purpose. They must be perfectly fresh, however, and be served with the greatest care to make it resemble the sea horse's natural food.

The barnacles are provided with a net which they move through the water to secure their food, and are also very particular in their fare. The juice of clams or oysters is usually fed to them by dropping it in the water directly above them. The barnacles subsist on the fibers of the mollusk. The smaller crustaceans are fed with very small pieces of young hermit crabs, snails, lobsters, etc. The coral polyps and other very small varieties are fed in a similar way. Great care is always exercised to provide the best quality of food and to vary it so as to make it appetizing to the fish. The work of feeding and the antics of the fish while eating are well worth watching. The feeding hour is indeed by far the most interesting part of the day in the great aquarium.—*Scientific American.*

"My Hobby."

Everyone seems to have "a hobby"—and somewhere between Theology and Oology I have "My Hobby" viz: Genealogy. The Genealogist finds some queer representatives of the "Genus Homo" —living and dead, and generally continues to get about as much pleasure in running down a stray man as does the Oologist in hunting up a strange bird or the Theologian in splitting hair with his opponent.

The question of Heredity comes closer in Genealogical research than in any of the other "ologies," and we often find freaks so strange in it as to make us doubt its very existence until we have traced back a few generations and discover its hidden cause in evil temper, degrading habits and vagaries of mind. The records of our Probate Courts furnish strange proofs of eccentricity, libels on humanity, hatred of parents against children, simulating the character of wives and seemingly delighting in spreading upon the pages of these records all the failings of kith and kin—is it any wonder that the descendants of such ancestors are fain to acknowledge the truth of the Darwinian Theory?

It has always seemed a strange thing to me to hear a man dilate by the hour on the pedigree of his horse, or his herd of Jersey cattle and yet not be able to tell the maiden name of his mother! And it is fully as strange that he fails to make record concerning the births and marriages of his children, while he registers every detail relating to his stable or stall.

The old Dutch Church records of marriages, births and baptisms from the settlement at New Amsterdam down to about the year 1800 are models of historical correctness, and the Mywhen's and Van's of today are very proud of their relatives, the sturdy Burghers of 1635, as traced down to them through these well kept tomes. And with a still greater degree of pride, the New Englander who can claim a "Mayflower pedigree" points to the proofs recorded in the quaint volumes of the Plymouth Church and Colony, as undisputable evidences of his blue blood and nobility.

Very generally, the Genealogist can rely upon tombstone evidence as a link in connecting families allied by marriage (but cannot always rely upon the truth of the epitaphs). In one instance I was exceedingly puzzled by finding two monuments side by side erected to the memory of two Marys of the same name both of whom died at the same date. Following up this singular "coincidence" I found that a son of the deceased had caused one of the stones to be erected, and a daughter who was not pleased with the epitaph, etc., of the first stone had another put in place by its side—and so for half a century people have been wondering at this strange instance of the death of the two Marys.

Visiting an old forsaken burial spot on Long Island, searching for some trace of the last resting place of an honored man whose descendants were made rich by his landed investments, I said to my guide that it was a shame to let this plot be kept in such an untidy condition, and suggested that the friends of those buried here should at least put a fence around it. "Well," said he, "we did once try to take up a subscription for to do that, but old Squire B. just knocked the wind oughten us when we went to him with it; 'A fence around the grave yard! What for? Them that's in can't git out, and them that's out don't want to git in! What's the use of a fence?' " queried the Squire.

But I guess your readers have enough of Genealogy for the present, for I know I am but intruding on the pages of a journal devoted to other topics, and do not wish to tire them with recollections of events of perhaps no interest to them, yet it is "My Hobby" and once in a while I find a "Genus Homo" who shares with me in a ride to the regions where old musty volumes tell strange stories of the past, bidding us heed their lessons so plainly written out for the good of our race.

DAN'L H. CARPENTER,
Maplewood, N. J.

Science in Schools.

BY MORRIS GIBBS, M. D.

It has been much discussed of late, whether the sciences should be dropped from our lower schools; many claiming that the various branches should only be pursued in college courses. It is the writer's idea that the course of scientific instruction should begin with the kindergarten and as soon as a child-mind can grasp a wonder item.

I might have headed this article 'Science in All Schools,' and it would have appeared more liberal and consistent; as it is palpable to all instructors in the scientific branches, that the latitude of their provinces cannot be gauged too widely. We cannot err in comparing too wide a space in Nature's Realm, provided our methods of imparting knowledge conform to the more or less advanced requirments of our pupils. It is only when we attempt forced marches that failure attends our efforts in the scientific branches. Even then, there are so few, outside of the school, capable of judging of the merits of one's scientific attainments, that the scholar goes forth, to the public, an acknowledged epitome of learning. This too, only too frequently happens, for I am pained to record that fully nine out of ten, particularly in our academical and so called high school systems, are subject to this forced march practice in scientific pursuits. This occurs from the graded system and the consequent endeavor of the pupils to master each successive pursuit in the course, regardless of disinclination, and often notwithstanding actual inability; this too, with the

knowledge of the mechanical, handicapped teacher. A teacher bound hand and foot by the grade system.

If, however, the pupils are so generally unable to acquire more than a superficial knowledge of the sciences and which is rarely used, and therefore usually forgotten, it is as much from the following methods of instruction in vogue as from the forced manner of study. Taking the languages as a comparison; it would not be deemed practicable to permit students to elect the study of the French language, who had no knowledge of English grammer. Still, it is not rarely, that scholars are advised to adopt biology, who have not the slightest knowledge of zoology, and it is quite common to see persons in a class using a microscope, who do not understand the circulation of the blood, or the difference in the teeth of the carnivora and herbivora. This compares favorably with a school which was not rare a couple of generations back, where the pupils read the histories of Rome and Greece in the original, and yet knew nothing of the history of their own country.

One can safely say that of the studies, Botany, Zoology, Physiology, Astronomy, Philosphy and Chemistry, that generally constitute the scientific course of the academy or high school, the average student, cannot at the expiration of five years, give the parts of a flower, demonstrate, the circulation of the blood, or name the constellation in which a planet is visiting, or name the planet. Occasionally a pupil who is unusually intelligent and an observer, makes his knowledge available, but as a rule, all attempts to improve are stopped as soon as school days end. Often too, and this practice is followed from kindergarten to college, duties are shirked.

It is a not uncommon practice in botany classes, where a certain number of identified preserved species of plants are required, for the pupils to copy from one another the written classification and nomenclature, in order to lessen their work. It is frequently very difficult for them to secure the requisite number, thirty to fifty, and many fail, and this at a time when it is easy to secure the number any one day by one familiar with our flora. One season the writer was importuned by several students from a seminary, to furnish pressed flowers, with accompanying data and classification. A number were supplied, much to the young ladies satisfaction, as thereby the onerous duty was curtailed. This was many years ago, and the ludicuous notion occurred to me to enroll several rare species, with some quite unheard of hereabouts, and others with fantastic names which, if submitted to philologists would have caused wonderment. Comment was not forthcoming, and strange to say the students with the remarkable collections passed well. Who can wonder at the lack of interest displayed by the pupils, when they were instructed by so ignorant a teacher.

It is quite as often that the teacher is at fault, either from absolute inefficiency or from the rules of the system which bind, as that the pupil is to blame. I well remember how my teacher in zoology spoke of the incisor teeth in a cow's upper jaw, and numerous other errors. How our teacher in natural philosophy disputed the boys in regard to shooting a candle through a pine board, after we had performed the act. It is hardly complimentary to enumerate the errors of our instructors, and we shall not do so further, but the truth remains, that most teachers make mistakes, quickly noticed by the pupils, and this too on subjects wherein they are expected to be, and should be, well informed. Errors which they would never have made had they received proper instruction.

Not only is it essential, but absolutely indispensible to those who are to teach, that the early education should be carefully attended to. If the elementary branches are ignored it is hardly probable that one will be permitted to intruct in our schools, even in the simple branches. Yet we are constantly reminded of the inefficiency of certain ones, who are delegate to teach the elementary sciences, and who are as ignorant of their unfortunately selected province, as a child of five is of Greek. All have noticed that the instructors in the sciences are chosen as second in point of standing to the others; an apparent acknowledgment by the school directors that but very slight importance is attached to these studies. In fact it is the case that after the regular studies are assigned, it is customary to give the scientific branches to any teachers who still have hours to spare in the school routine.

As the farmer remarked, who had done all that could be accomplished for his crops, and failed: "I can't make the weather!" Professors would all voice their inmost thoughts if they acknowledged that the power lay in the school-board, and that if the board was properly made, all would be corrected. For it is upon that, that the whole matter hinges.

The love for scientific study will be developed sooner or later in all who are naturally inclined in this direction. But there are many also, who need an impetus, if only a few weeks of judicious instruction from a capable, painstaking teacher, who will gain much pleasure and profit from the pursuit thereafter. To those who eventually become teachers, this early instruction is most important. The preliminary study is almost sure to lead to further investigation and enlightment, if supervised by an intelligent instructor, one who is really interested in the subject. The fund of knowledge, however small, gained at this time, will prove to be invaluable in later years, and will surely be a perennial source of pleasure.

Twenty-five years ago, or more, the pupils of my age studied a simple but very interesting work, entitled "The Child's Book of Nature," by Dr. W. Hooker, which exactly meets my views as a beginning on the subjects embraced. The topics as treated, were handled in a manner that indicated a knowledge of child-wants, being presented in a charming yet very simple manner. I am afraid that the worthy little book is no longer employed in our schools, nor do I know of any work of that nature which is used at present.

Children can not be taught elementary science at too early an age, and the experiments which may be presented to pupils in the kindergarten, are not rarely impressed on the eager child-mind with a vividness unequaled by anything simply learned from books. The demonstration of the expansion of steam, as exemplified by a cork in the spout of the teakettle, is far more lasting than book description. The action of heat or rarification of air, in the experiment with an inverted teacup containing burning paper placed in a saucer of water, does more towards inducing investigation than reading from a natural philosophy can possibly do. In the botany class, a single trip in woods and fields with a competent teacher, will accomplish more than the

oft-times tiresome routine work of the school room. But these trips are rarely made and in many cases entirely neglected. In anatomy, dissections should be made on reptiles and the smaller mammals; for in addition to observing the expansion of the lungs, exemplified as well, in a squirrel, cat or rabbit as in the human cadaver, there is the additional pleasure of comparative study in many parts of the body.

Not less important are practical demonstrations of the heavens on clear nights by a painstaking instructor. Although a telescope is a valuable adjunct, it may often be dispensed with when the constellations are being studied, for the naked eye is sufficient in defining star-groups. An interested teacher can produce better results by instruction under the star-bespangled vault; can give a better idea of the course of the moon among the stars, and more lasting impressions as concerns the constellations, than is possible from one, no matter how well up in mathematics, who relies on blackboard and chalk. Instruction by long rows of figures, often, nay, nearly always, becomes oppressive and distasteful, but a view through a telescope, revealing the satellites of Jupiter cannot fail to have an impression of wonder mingled with awe, which to a thoughtful child or youth tends toward the acquirment of further knowledge.

One could continue this subject indefinitely. Let us have the sciences in all schools, but assuredly let us have the elementary branches in science and at the proper time. For if our boys and girls can once get an insight into the work, with the aid of competent teachers, then those who have developed a predilection for the sciences, can and will go on with these pursuits, even if unaided.

Kalamazoo, Mich.

Dry Preservation of Anatomical and Other Preparations.

The preservation of bodies or parts of bodies, without the trouble, expense, etc., of fluid preservatives has long been the ideal of preservation. In fact the first attempts at preservation of bodies was probably by the "dry process." In ancient times many nations and tribes preserved their dead as mummies. Various processes were used and various results obtained. In America bodies are found which were simply dried, e.g: the Alaskan cave mummies. At the other end of the New World, in Peru and Chili, are found bodies which were preserved by drying in the sand, which there contains quite a percent of sodium nitrate. These mummies are none of them very life like; being reduced by drying to mere skeletons covered with a yellow parchment-like skin. Also when brought into ordinary climates they show, to most noses, strong evidences of decay. The Egyptian mummies were preserved in various ways and with varying degrees of success; they all resist decay, but they all show a decided shrinkage of the muscles, etc., during preparation, and this destroys much of the trueness to life.

In modern times various processes of embalmiug are used and most of these try to prevent much of the shrinkage. The underlying principles of modern embalming are thorough permeating of the flesh and viscera by some antiseptic and hardening agent, and the replacing of the water of the body by some nonvolatile substance.

The first is generally done by washing out the veins and arteries and then filling them with a solution of some of the various metallic salts: notably the chloride and sulphate of zinc, mercuric chloride, arsenious acid, potassium and sodium nitrate. Solutions containing one or more of these and other substances are often used. The viscera are also filled with these fluids. Day after day, as these fluids evaporate, glycerine is injected into the blood vessels, and the glycerine being nonvolatile preserves the plumpness originally caused by the water of the body. Such a process is, however, too tedious and costly for ordinary anatomical and Natural History specimens.

Articulated skeletons (those with the ligements in place) preparations to show relations of tendons, etc., blood vessels injected with plaster and simular objects may be preserved by simply poisoning and allowing to dry. If they are soaked in Wickersheimers, fluid, tendons, etc., will retain much of their pliability.

Formula—Potash alum 100 grams, Sodium Chlor. 20g., Salt petre 12g., Carbonate of Potash 60 g., White Arsenic 20-25g. Dissolve by boiling in 3,000 cubic centimetres of pure water. When cool add 1,500c.c. of Glycerine and 300c.c. of Alcohol. Label Wickersheimers Fl. Specimen intended for dissections only may be kept in this fluid. They become, however, slightly "greasy" to the touch after a time.

As a whole, however, dry preparations of soft parts and whole animals cannot be made which will show a true resemblance to nature because of shrinkage.

The successful embalming of birds has long been attempted but shrinkage has caused them to be mere caricaturesof living specimens. Dr. Morris Gibbs claims to have found a method by which this is compensated for and good specimens obtained. His method will probably be a great boon for those who have never learned the difficult art of Taxidermy.

There is a process of dry preservation used in Europe for the preservation of Brain dissections and of small animals which prevents all shrinkage of structure and preserves the histology fairly well. This is known as Giacomini's dry process.

The tissue is killed and hardened in a solution of zinc chloride, Bichromate of Potash 3 per cent, Mullers fluid, 10 per cent Nitric acid, or Alcohol.

Supposing zinc choride is used. The object is left in this solution until it sinks to the bottom. It is then transfered to commercial alcohol, ie: 70-95 per cent Alc., for from 10 days to a month. It is then removed to pure glycerine containing 1 per cent carbolic acid, cover the receptacle and leave object till it sinks below the surface. Then remove it at your earliest convenience and place it on a dish out of the way of dust for a few days till it has thoroughly drained. Then varnish it with a thin solution of India Rubber or with Marine Glue diluted with a little alcohol. Object should be left a month or so in chromic solutions.

In Nitric acid, 10-12 per cent, for 10 days. This gives very tough preparations of brains. Objects hardened in chromic solutions or Nitric acid should be thoroughly washed 3 or 4 times in water before placing in alcohol. All dissections should be made before placing in glycerine.

In general it may be said that objects should be preserved in fluid.

Dry perservation;, except Taxidermy is good only for special cases, and the amateur, unless he has plenty of time and supplies, had better stick to fluid preservation.

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Buffalo.....		8:55	10:55	1:25	5:15	8:45	

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Niagara Falls.	6:35	8:05	11:10	1:40		5:50
Susp. Bridge .	6:45	8:10	11:20	1:48		5:55
Lockport.....	7:30	8:50	12:00	2:25	5:55	6:35
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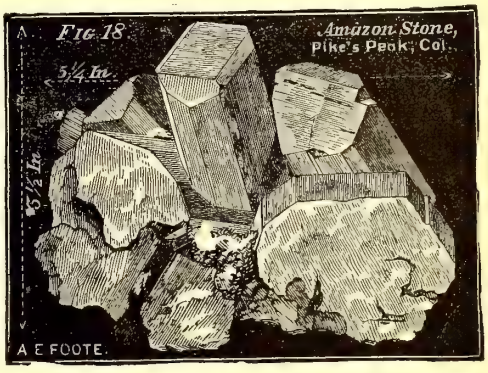

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Amateur's size, 2¾x2 in.....	.....	.....	.....	10 00	20 00	45 00
High School or Academy size, 2½x3½ in., Shelf Specimens	.....	.....	.....	25 00	50 00	125 00
College size, 3½x6 in., Shelf Specimens.....	.....	.....	.....	50 00	100 00	250 00

No references are given because there are but few institutions in America that have not purchased of me and but few countries where I have no customers.

Many of the scientific men of the country recognizing the advantage of having such an exchange, have placed copies of their papers in my hands for sale on commission. Our lists of scientific books are sent free on light paper, except the 200 page Medical Catalogue, same price as the Mineral Catalogue. Heavy paper, see page of book abbreviations.

All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

When any book inquired for comes to hand, a memorandum, stating description and price will be sent. In our book catalogues the prices opposite the latest number supersede former prices usually where descriptions are the same. My arrangements for noting the needs of my correspondents are nearly perfect.

Over 300,000 pamphlets and papers, many uncatalogued, in stock. I will get what you order ultimately.

FINALLY AND OF THE MOST IMPORTANCE.—We must especially request our customers to let us know of all mistakes and errors that may occur at our establishment. We can and will gladly rectify them at our own expense.

Broken Bank Bills.

I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c.

J. E. HANDSHAW, Smithtown Branch, N. Y.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Natural Science News.

ADVERTISING RATES.

Only 5c per norpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

100 lines	4½c	per line.
200 "	4	"
300 "	3½	"
500 "	3	"
1000 "	2½	"
2000 "	2	"

A column contains 120 lines; a page, 360.

A little two-line ad. would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

A small one inch ad. run one year would use 624 lines and would entitle the purchaser to the 3 cents per line rate, and cost only 36 cents per issue.

A 3¼ inch ad. run one year would use 2,028 lines and would entitle the purchaser to the 2 cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).

35 cents postpaid.

"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

CHAS. K. REED,

Naturalist and Taxidermist,

AND DEALER IN

Naturalists' Supplies and Books.

Manufacturer of Oval Convex Glass Wall Shades (Patented).

A specialty made of fine work on Fish and Game Heads or Large work of all kinds.

Fur Rugs and Robes Tanned, Lined and Mounted.

No. 262 Main Street, Worcester, Mass.

Camp Agassiz.

A summer home for boys, conducted by an experienced Naturalist. Good fishing and boating with plenty of Natural History work. For particulars address,

CHAS. B. WILSON,
JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

Easter "Snap" No. 2.

I have recently received a big lot of those showy South American Birds Skins, prepared by native collectors, and taken in U. S. Columbia. They are unnamed, unlabeled and unscientific: but unquestionably, they will soon be unloaded at the unparalleled offer which I make underneath. They are selected skins and a *good* Taxidermist might (?) mount into respectable looking specimens. They consist of Hummers, Finches, Buntings, Sparrows, Warblers, Wrens, Flycatchers, Tanagers, Starlings, Woodpeckers, &c, &c., and for

ONLY $2.00.

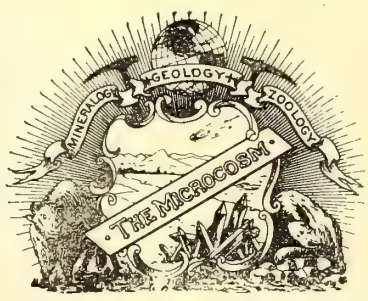
I will send you twelve (12) of these skins, *prepaid.* This lot will contain no duplicates and with it, I will include at least two (2) varieties Hummers. Now these 12 skins, I think, would "Catalogue" at fully $6.00. They are of no use to me (and perhaps of none to you) but, nevertheless, you can have the lot—12 of them—prepaid for **Only $2.** And in addition, I will make every purchaser of this collection a present of a fine pair of Snowflake (*P. nivalis*) skins, alone worth from 50 to 75 cents.

I have only 18 of these lots, and this offer is good until May 15th only.

Remember $2.00 gets the 14 skins by return mail, prepaid. Write quick if you want them.

Faithfully,

FRANK H. LATTIN, Albion, N. Y.



Relief Maps,

Systematic Collections,

FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals.

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs,** including *Falco tinnunculus,* etc., etc.

HERMANN ROLLE,
INSTITUTION FOR NATURAL HISTORY,
Emdener-Str. 4, Berlin, N. W., Germany.

To Dealers and Collectors: Will furnish small Fossils, Shark's Teeth and Corkscrew Fossils from Stafford Co., Va., for $1.50 per 100. The fossils are something new and unique. GEORGE W. KIRTLEY, Fredericksburg, Va. Ao-10n-e3mo.

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

AMPHIUMA.

Some material now on hand.

Parties desiring same should write us at once as it will soon go.

Scapiopus. A lot just secured—alive and prepared.

Turtles, Lizards, Snakes, Toads, Frogs, Salamanders, Bird and Mammal Skins and Skulls.

Histological Material.

H. H. & C. S. BRIMLEY,
Taxidermists, Collectors and Dealers,
RALEIGH, N. C.

R-I-P-A-N-S

ONE GIVES RELIEF.

CRYSTALS.

E. H. HARN, Collector.

If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large movable water drops as large as peas; **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

Rutitated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Colinubite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Oclopedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address.

J. H. RUGG,

Box 262. **Blairsville, Pa.**

A Genuine Japanese Cat's Eye.

Mounted on roll plate. Guaranteed no fake or trash, sent postpaid for 25 cents in silver.

Send stamp for price list of our Jewelry and Novelties.

Special price made in dozen lots to the trade. RUFTS & HAGELEY, 269 Dearborn Street, Toom 516, P. O. Box 1071, Chicago, Ill.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

Natural Science News.

VOL. I. No. 12. ALBION, N. Y., APRIL 20, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

I COLLECT and prepare everything in the natural history line. live specimens if desired. Bird skins to exchange for skins or sets. Correspondence solicited. J. F. ILLINGWORTH, Pomona College, Claremont, Cal.

WANTED.—Gray's "Manual and Lessons" (revised). Have books and boys papers to exchange. Other scientific books wanted. MALCOLM McLEOD, So. Hadley Falls, Mass.

ABOUT 60 copies miscellaneous publications on Natural Science, many *good* and some valuable catalogues, etc., for best cash or exchange offer. B. S. BOWDISH, Phelps, N. Y.

TELESCOPE wanted in exchange for fine sets, rifle, camera, printing press, or cash. Address all communications to GEO. GRAHAM, (A. L. V.) Gainesville, Fla.

WILL GIVE good exchange in first class eggs and skins for a snap-shot camera and a collecting pistol. Any one having either will do well to write me. THOS. H. BLODGETT, Galesburg, Ill.

FOR SALE.—Polished woods, minerals, birds' eggs, native ferns, Chinese chop sticks, bracelets, dolls. horn nuts, etc. MISS IDA C. NICHOLS, Freestone, Sonoma Co., Calif. o

WANTED.—To purchase a collection of eggs, must be cheap. What am I offered for a foot ball and inflator and tennis racket. JAMES E. MALLORY, Baldwin, Kans.

A FEW SETS yet left of my Mexican collected Gilded Flicker and Mexican Goldfinch. Reliable parties desiring to purchase on approval at their own prices send stamp with offer. B. S. BOWDISH, Phelps, N. Y.

STEAM ENGINE.—I have a patron who wants a good small second-hand engine and boiler of from 2 to 4 horse power. If you have one in good condition that you will swap for eggs, skins, shells, specimens or curios of any kind, write FRANK H. LATTIN, Albion, N. Y. tf

U. S. REVENUE Stamps and Philatelic papers, catalogues, etc., wanted in exchange for Col. stamps or other Revenues and Papers; or if cheap will buy for cash. Send lists. GEO. E. CLEAVER, Reading, Pa.

I WANT AT ONCE a few eggs of each N. W. Crow, Fla. Grakle, Plumed and Scaled Partridge, Prairie Sharp-tailed Grouse, Sharp-shinned Hawk. Sets or singles, cash or exchange. Write quick. FRANK H. LATTIN, Albion, N. Y.

WANTED! Wanted! Wanted! Any kind of old U. S. postage or Confederate local stamps. I will give full catalogue value in first class sets of Southern California eggs. Stamps catalogued at from $5 to $100 especially desired. C. M. HATFIELD, South Pasadena, Calif.

BEAUTIFUL pink satin spar, from Salt Mines 555ft down, 15c. Send any fossils, rare minerals, bird eggs, stamps or curiosities and receive value for value. CECIL E. HOUDYSHELL, Holton, Kansas.

TO EXCHANGE.—A Harvard camera outfit, nearly new, cost $2.50. Will exchange for best offer in eggs in singles or sets. For particulars address, LEROY PALMER, Box 151, Catskill, N. Y.

I HAVE 1500 small T perches. 3 inch base, oak fine finish 8c each; pine painted white at 6c each. Will take half cash and balance in exchange. I will turn any kind of T perches, round flat stands, bases for glass shades or anything in the line at a very low price. Write for prices. E. L. HALEY, Phillips, Maine. 13t5

When answering advertisements always mention the NATURAL SCIENCE NEWS.

WE WILL collect specimens in all branches of Natural Science. Prices sent upon application. Write at once, as we are booking orders now. HERSHEY & REED, Nebraska City, Nebraska.

WHITE RATS, just right to train. Forty (40) cents per pair, or two (2) pairs for seventy-five (75) cents. WM. R. EASTON, Box 207, Jefferson, Ashtabula Co., Ohio. 12-2t

CIGARETTE Pictures to exchange; send offers; will sell. Want foreign coins, bank bills, confederate notes, Indian pipes, etc. F. L. ENGLEBERT, Nicetown, Phila., Pa.

WANTED.—To correspond with collectors with a view to exchanging New England Lepidoptera of this seasons collecting for specimens in papers from other localities. E. H. RICHARDS. Box 414, Woburn, Mass.

A LARGE list of singles and some duplicate sets to exchange for sets not in my collection. Also minerals and fossils to exchange for same. Eggs *must* be *strictly* first class and fine. Send list. GEO W. DIXON, Watertown, S. D.

WANTED.—Collecting pistol in good condition. Will give in exchange, "U. S. Reports" on palæontology, ornithology, botany, etc. Give description, condition, and lowest exchange price in first letter. J. H. RILEY, Falls Church, Va.

FOR SALE. Skull of "Flat Head" Indian, minus lower jaw, in excellent condition. Send two cents for photograph to A. T. WHITEHOUSE, Maywood, Ills. 12-2tO

I WILL exchange my entire collection of curios, value not exceeding $8. For books, for further particulars address, JOHN DOELLE, Box 192. Yale, St. Clair Co., Mich. 12-2t

WANTED.—Steele's Fourteen Weeks in Zoology. Have "Natural History Survey of Illinois. Ornithology." Write for description. All letters answered. F. WENGER, Concord, Illinois.

SCHUYLER TRAPS for collecting small mammals. Price *prepaid*, each, 15cts; two for 25cts. FRANK H. LATTIN, Albion, N. Y.

OOLOGISTS Attention! Those desiring strictly 1st class sets with full data, from the following list, send in orders at once, to be filled as soon as collected at ½ catalogue rates. Least Tern, Green Heron, Killdeer, Osprey, Turkey Vulture, Belted Kingfisher, Flicker, Crested Flycatcher, Am. Crow, Fish Crow, Meadowlark, Orchard Oriole, Purple Grackle, Bank Swallow, Barn Swallow, Mockingbird, House Wren, Long-billed Marsh Wren, Wood Thrush. Can furnish a handsome series of Osprey's, showing variation in markings. FRANK B. EASTMAN, Easton, Md.

RARE CHANCE.—First class eggs in full sets with complete data taken at one-half standard catalogue prices in exchange for the following: Midget self-inking rubber stamps with one line of reading and ink. 50cts., extra lines of reading, 5cts each; a 3A 4a font of pica rubber type with four line holder and excelsior pad $2, just the thing for printing labels, envelopes, etc. Rubber stamps of all descriptions exchanged for eggs. Enclose stamp when writing. ARTHUR L. POPE, Sheridan, Ore.

FOR EXCHANGE.—I have two bicycle brakes; 1 hand and one foot brake as used on the Rambler wheel, both in fine condition. Also a book called "Dragon Flies vs. Mosquitos" with an introduction by R. H. Lamborn, Ph. D., good as new, cost 1.50. Wanted, skins or eggs of birds not found in Maryland. STEPHEN, P. HARWOOD, 1532 Park Ave., Balto., Md.

WANTED, GUNS.—Two or three small collecting guns, for small bird collecting. Must be in first class order. Will give part cash, rare eggs or skins. W. RAINE, Toronto, Canada.

$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

ELK FOR SALE.—Herd of 10 Elk, all ages, six does, four bucks, three with antlers. Herd $800, or will sell trios. Write business. WILL C. HALL, Creston, Ia.

FOR SALE.—Navajo blankets, Mexican pottery, opals and curios. Write for prices. CLIFF HALE, Phœnix, Arizona. 9w4

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N.Y. tf

FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

Got a Shot Gun? I want a new Baker hammerless, Damascus steel barrels; or a Winchester Repeater, model of 1893. Want to give fine Minerals, Fossils or Indian Relics in exchange. Write me. L. W. STILWELL, Deadwood, S. D. tf

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

I have used your columns to good purpose in the exchange of shells. Mrs. H. W. Ruggles, Milton, Mass.

As an adv. medium it can't be beat. I received letters from all parts of the Union and Canada and made some valuable exchanges. C. W. Prier, Appleton City, Mo.

I received over one hundred answers to my ad. in the N. S. N. and think it a splendid advertising medium. J. S. Noah, East Liverpool, Ohio.

I received reply after reply to my ad. in the NATURAL SCIENCE NEWS. FRED E. POMEROY, Lewiston, Me.

I received many answers to my card and it is a valuable advertising paper. L. L. LEWIS, Copenhagen, N. Y.

In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

I have received enough replies from my first notice to convince me that NATURAL SCIENCE NEWS is a first-class advertising medium. R. C. ALEXANDER, Plymouth, Mich.

From a little 35 cent adv. on this page in NATURAL SCIENCE NEWS of Feb. 9th Mr. Henry Clark of Gaines, N. Y., received cash orders for $15.50 worth of Ferrets.

I have received many answers to my advertisements and think, as an advertising medium, your NATURAL SCIENCE NEWS is unequalled. Wishing you success with your paper, GUY K. BARNES, Strawberry Point, Iowa.

HAVE been receiving very satisfactory replies from my notice in the NATURAL SCIENCE NEWS. W. J. B. WILLIAMS, Holland Patent, N. Y.

Had many replies to my other little ad. I had to get an extra clerk to answer letters. ROBT. BURNHAM, Dennis, Mass.

MY AD. in the NATURAL SCIENCE NEWS paid me wonderfully. L. M. CLARK, Suffield, Conn.

In the last seven years I have advertised my process of embalming in twenty-seven papers and magazines. For the number of replies and direct returns, your NATURAL SCIENCE NEWS advertisement eclipses all previous seasons, and discounts all other amateur local and general attempts. Respectfully Yours, MORRIS GIBBS, M. D., Kalamazoo, Mich.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

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This will please Collectors.

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BOX 502, COLUMBUS, O.

BIRDS Skins, Eggs, Stamps, etc., at lowest rates, 12 var. bird's skins, $1 Mounted birds, 50c. List free. F. T. CORLESS, Los Gatos, Calif. 6-12t

Special 60 Day Offers.

10	varieties perfect Indian Relics	$ 90
6	" " " "	50
12	" " " "	1 10
5	" " " "	25
20	" " " "	2 50
15	" curiosities	27
25	" "	50

Best of all! 1 Spear Head, 2 Arrow Heads, 1 War Point, 1 Knife, perfect, 35 cents. Every one of the above are perfect in every way sent by return mail, for 60 days only. Remit by money order. Price list free. Drawing and special prices of any goods you may need, 4 cents.

W. PERRY ARNOLD, Stonnington, Conn.
a&m

Just try these

Series of Minerals. You will be delighted with them.

Scale of Hardness,	9 specimens	$1 00
Color Collection,	25 "	6 00
Blowpipe "	25 "	1 00
Scale of Fusibility,	6 "	1 00
28 Microscopic mounts		6 50
12 different Cut Gems in Velvet Case		6 00

Systematic Collections

for Schools and Museums, mounted on blocks and scientifically labeled and arranged according to Dana, viz:

250	large specimens	$100 00
150	" "	50 00
115	" "	25 00
100	smaller, in trays	10 00
65	do	5 00
Gold and Silver Ores,	15 specimens	10 00
Copper Ores,	15 specimens	2 50
Ores of Common Metals,	25 specimens	5 00
" " "	25 " smaller	2 50
Ores of Rarer Metals,	15 specimens	3 50
10 Miscellaneous Crystals		2 00
Chalcedony Geode, new, and unique		25

Polished specimens of all kinds, sizes and prices.

Ancient Stone Relics; Fossils; Agate, Pyrites and Aluminum goods.

Priced Catalogue for stamp.

Black Hills
Natural History Establishment,
Deadwood, S. D.

ESTABLISHED 1884.

P. S.—Catalogue tells you how to get goods on selection. You suit your taste by seeing before buying.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

ARTISTIC MOUNTING!

This is the season for ornamenting the School, Museum or House.
This is the time of year to mount objects of Natural History.

BEWARE OF IMITATIONS!

Do you wish to learn an easy, simple method of mounting birds, mammals, &c., &c?

Do you wish to mount specimens in a life-like manner, at less than one-fourth of the work of the old style?

Do you wish to learn a process of mounting birds which requires absolutely no tools beyond a file, wire and knife, and which costs less than one-tenth of the amount necessary in the old method?

Then investigate the legitimate process of Embalming, and you will be satisfied; as thousands of others are, in this broad land, that it is the method of choice with all amateurs, and is constantly growing in favor with professional taxidermists, and experienced naturalists.

It is the process of mounting which appeals to the thousands of men, women, boys and girls who are not possessed of $10.00 to $50.00 to spend for tuition. It appeals to the business man and sportsman who have no time to waste on idle details of taxidermy, yet who wish to preserve an occasional specimen taken with the gun or rod. It appeals to school boys and girls who are too busy with their duties to spend months in learning the old method of mounting. It appeals to all fathers and mothers who are interested in the entertainment of their children, and who are desirous of ornamenting their homes, as well as to advance their children in the love of Nature. It appeals doubly to those teachers who love the woods and fields, and whose young scholars can be taught to study Nature by this influence. It appeals to thousands of persons, young and old, who can afford neither time nor money to learn to "*stuff*" birds, yet who are anxious to attempt the work in a simple style.

If you care to attempt this system, you will be convinced that it is simple, durable, satisfactory, and has many advantages over the traditional methods in vogue.

Any child can learn it, and many testimonials have been received showing that the process has been mastered in a single attempt.

The instructions embrace complete directions for embalming, wiring and mounting birds, the hanging of game birds for plaques or wall pieces, mounting of mammals, fishes and deer heads, etc., etc.

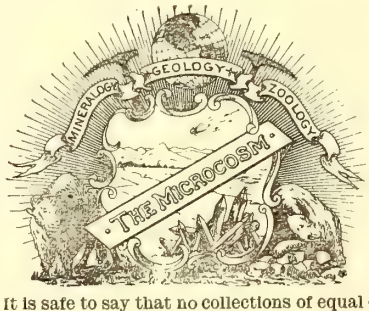
In addition to the printed instructions, one pound of the embalming compound is also sent. This is sufficient for from twenty to thirty birds, the size of a robin.

PRICE, 75 CENTS.

Much cheaper for second orders, and by wholesale.

If more information is required, enclose stamp and mention the NATURAL SCIENCE NEWS.

MORRIS GIBBS, M. D., Kalmazoo, Mich.



Relief Maps,

Systematic Collections,

FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals.

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C.

Magnifying Glasses! Insect Pins!

Botanical Collecting Cases!

Our sale in liquidation still continues at Greatly Reduced Prices.

SEND FOR CIRCULAR 623.

J. G. GRAY, Assignee. QUEEN & CO., Inc., Philadelphia.

Natural Science News.

VOL. I ALBION, N. Y., APRIL 20, 1895. No. 12

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

TERMS OF SUBSCRIPTION.

PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN,
Albion, Orleans Co., N. Y.

Moths and Toads.

The article on Butterflies in NATURAL SCIENCE NEWS of Feb. 23d was very interesting, and I hope it may induce many, who have not already done so, to begin the study of these beautiful insects.

I would like to suggest to a few who are students, like myself, that the most interesting way to begin is to raise specimens from the larvæ, which can easily be done with a great many species. Of course in order to do this with success, one must study their habits, and find proper food for each, for it is true of worms, as well as people, that "what is food for one, is poison for another."

Many persons are accustomed to call all Lepidopterous insects "Butterflies" and have no idea of "Moths" except the common clothes moth, and sometimes even mistake the larva of that insect for the moth, and if they are called to admire the delicate green of the *Attacus luna* or the brilliant yellow and purple of *Dryocampa imperialis* will exclaim, "What a pretty butterfly."

Nearly every one has a horror of "worms," and a high school student once asked in tones of great disgust if I "had ever seen one of those horrible green *deadly poison* worms with a thousand legs, that were sometimes on tomato plants," and could hardly believe that one of the most beautiful Moths in my collection came from just such a worm, which I had captured and fed from a tiny larva, and kept through the various stages.

Among the many pleasant ways of studying this branch of Natural History, I wonder how many readers of NATURAL SCIENCE NEWS have tried collecting Moths and other night flyers, by "sugaring trees?" My experience has been very amusing, and besides learning something of Lepidoptera, I also found an opportunity to watch the curious ways of some Batrachians.

One warm night in August after coating an apple tree with plenty of sugar and rum, I left it an hour or two for the usual guests to assemble, then crept softly out with a dark lantern, and when near the tree threw a bright light upon Moths and other insects, and also upon a group of astonished toads who had hopped close to the foot of the tree and stood with widely opened eyes ready to see and seize every unwary insect which had come within reach.

After that I used to sit down near the tree every evening, and listen to their approach as they came hopping over the grass from every direction. I often counted ten at one time, and there were seldom less than half a dozen. They came as freely and punctually as the invited guests.

R. SIM,
Jefferson, Ohio.

Indian Funeral Trees.

A remarkable specimen of the red cedar was recently unearthed by the opening of the Metzgar Indian Mound, on Deer Creek, near Yellow Bud, in Ohio. A large bed of ashes, a quarter of ăn inch in thickness, covered a space of about ten feet by six. Near the edge of this ash bed a large log was found. It was about five and a quarter feet in circumference, and as sound as if buried but a few years ago. The side branches had been cut away from the log, and one of the scars was so perfect that the marks of the stone axes used in the work are plainly discernable. There are no cedar trees now growing nearer than ten miles from that immediate neighborhood, and none were there growing when the early settlers came, so that the trees must have disappeared from there long ago in the past, or the improbable alternative accepted that the log was brought from a long distance. Evidence was furnished that the log was originally about eighteen feet long. Right beneath the log was a skeleton of a human being. A small pen had been made of small cedar saplings, arranged in the form of a tepee around the large log. The skeleton was about two feet below the original surface of the ground, and the earth forming the mound over the skeleton had a depth of about thirty-four feet from the summit. The earth to form the mound had evidently been brought in baskets by manual labor, as the "dumps" in some cases, formed by different tinted materials, could be distinctly seen. The circumstances favorable to the preservation of the cedar log had evidently aided in preserving the skeleton, and it is possible the size of the log had some relation to a distinguished personage, The body had been laid straight under the log, with legs extended and arms at the sides. Around each wrist were two bracelets, made of native copper, and several hundred shell beads were around the neck and on the chest. It is believed that the dry ashes with which the body had been covered, in addition to the great depth from the surface, had aided in preserving the log as well as the human remains. Even traces of hair were found around the skull, as well as dried and shriveled portions of the brain were found, while rude cloth and matting, as well as buckskin, put over the corpse before the ashes, were in a fair state of preservation. As the use of the cedar log would seem to have been a matter of choice, it opens a new field for speculation as to the possibility of the tree having had some special significance in the funeral ceremonies of the Mound Builders. A section of the log has been secured for the museum of the Academy of Natural Sciences, of Philadelphia—the exploration, indeed, having been made under the auspices of that body—*Scientific American.*

WATER-PLANTS IN DEEP WATER.—A Delaware correspondent asks whether water-plants would grow on the sloping sides of a cistern at the depth of 25 or 30 feet. Some Potamogetons and the *Vallisneria* would no doubt grow well at that depth, and probably others—*Meehans' Monthly for March.*

Snake Collecting.

The following directions are prepared for the use of naturalists, who do not know the how, when and where of collecting in this interesting but neglected branch of Natural History.

A volume of detailed information might be written on the subject, but as space is limited, only a few concise directions will be given.

We can dispose of the when and where questions with a very few words. Spring and early Summer is the time to collect Ophidians, and they will be found in various places. Many species delight to lie in the sun, and usually no locality furnishes so many varieties as warm rocks, gravelly hillsides and sandy. sunlit plains. The aquatic species will be found in or near the water. Some varieties live in the deep woods, some in swamps, some in hollow logs. Barren lands and gravel pits are good collecting grounds. The rarer class of burrowing Snakes live entirely under ground. We will even find some species in the trees.

The tools necessary for the work are few and inexpensive: A gun or collecting pistol; dip net for aquatic species; a pair of old gloves; bags of cheese cloth; collecting box of tin with shoulder strap (an old botanical collecting can is excellent) or a fish basket. Lastly, but not least, a hypodermic syringe. All of these tools, with the exception of the last, are to be found in the laboratory of every working naturalist. A good hypodermic syringe, holding one ounce, can be purchased at any drug store for 50 cents.

There are three ways of capturing specimens: First with the gloved hand. This is perhaps the easiest and most satisfactory method to use excepting in the case of the Rattlesnake family. As an aid to this form of capture a forked stick or a stick with a fish hook straightened out and driven into one end, may be used.

The second method is easy and safe, shooting with No. 12 or dust shot. Of course many specimens obtained in this way are mutilated beyond redemption, but it is easier to obtain more with a gun than in any other manner.

Third, a fine noose on the end of a branch is reliable. Horse hair does very well for a noose, though in the case of large, heavy specimens it is better to use copper wire.

As soon as captured, specimens should be placed in the cheesecloth bags and laid away in the collecting can. The collector should always carry a supply of these bags of various sizes, from 4 inches by 5 inches to 4 inches by 10 inches. Slips with the number of the specimen can be pinned to each bag, this number corresponding to the number of an entry in the notebook from which to make out the labels at the end of the day.

This entry should contain: 1st, Running number; 2d, Locality; 3d, Soil and vegetation; 4th, Date of capture; 5th, General Remarks.

At the end of a day's collecting the specimens should be taken care of as follows: Kill all living specimens by dropping them in a two quart jar filled half full with a 50 per cent solution of alcohol. This seems to be the best as well as the easiest way to dispose of Ophidians. The alcohol seems to intoxicate them at first, and then as the head is submerged death comes by drowning.

Blood and dirt should be wiped away, and the specimens laid together on a glass plate for preperation. Take a careful measurement of length from head to tip of tail and diameter through the thickest part of the body. Note carefully the markings of the specimen and if possible make a rough drawing with colors accurately listed. As alcohol tends to bleach out all the brighter colorations, our marking and color records are our only safe guides to the accurate appearance of the snake during life. For very accurate work, Ridgway's "Nomenclature of Colors" should be used. If there is undigested food in the stomach, indicated by a bulging out of the sides, it should be removed.

All wounds of any size should be carefully sewn up with silk thread. Then we proceed to the injection. With the specimen lying on its back, we insert the point of the hypodermic needle under the first belly scale and inject alcohol until we feel the body expand slightly. Then removing the needle the operation is repeated every inch until the vent is reached. In large specimens it is well to inject the muscles also. If this matter of thorough injection is not attended to, specimens invariably decay from the inside, even though the exterior be well preserved.

The label should now be made from the entry in the notebook. The most satisfactory label is made of strong parchment paper and the writing done with a soft lead pencil. ¾ inch by 3 inches is a good size and by writing on both sides the space is sufficient. One side may be occupied with the date, exact locality, scientific name, number and name of collector. On the reverse may be written the color record, soil and vegetation data and the usual "Remarks."

Alcohol is the only reliable preserving fluid and the specimen with the label tied around its neck should be immersed in a 50 per cent solution (made by diluting 95 per cent alcohol with water) for 24 hours. If this weaker solution is not used first, the specimens are apt to shrivel and blister when placed in the stronger alcohol. Now bring out the specimen jars and after arranging therein your Ophidians in coils or loops to suit your own taste, pour upon them a 75 per cent strength alcohol, and your hideous, horrible snake enemies are turned into things of beauty fit to adorn the cabinet of a king.

For identifying all specimens use "Reptiles and Batrachians of North America, Part 1. Ophidia," by Samuel Garman, Kentucky Geological Survey. "Jordan's Manual" is a good book for beginners, but for real down-right work you want the best which is, of course, Garman's work.

This then comprises the art of snake collecting, briefly told, but I cannot close without a word of advice. Your collection of snakes will only be valuable to you as you study them. If you collect but one specimen this season study it well and you will be repaid. Pry into the secret of its wonderful vertebræ, dissect its muscles and see their uses, compare its internal organs with those of other animals. Make drawings of everything that interests you, write copious notes; in short *understand* the subject. For I truly believe that the anatomy and habits of one snake, well understood, is worth a hundred of showy specimens without that knowledge.

A. Mowbray Semple.

How to Make a Herbarium.

By Helena D. Leeming.

To make what the early botanists called a *hortus siccus*, or dried garden, has become a fine art. There

is but one recognized way for an American student to make a herbarium, and that is the method of preserving plants which is adopted by the colleges of this country, which is here set forth in detail. All scrap albums, sets of flowers mounted on cards, and floral groups must be relegated to the readers of souvenir books.

In selecting specimens to press, the whole plant, root and all, should be taken. If the plant is more than ten inches high, it should be bent over once or twice in a V or N shaped position. Specimens from a tall herbaceous plant should show a spray of flowers about 8-10 inches long, and a few of the leaves and the root. The fruit of a plant should always be collected and mounted on the same sheet. Seeds or pods that fall off can be kept in an envelope on the sheet.

For work in the field, a tin botany box is useful to keep specimens fresh; but a portfolio 12x17 inches, of wood, wire, or leather, and fastened with straps, is much to be preferred, as several hundred specimens can be brought home in it. It should be filled with folded sheets of unsized paper such as grocers use. These should be about 11x16 inches when folded. The fresh specimens should be laid just as they grow, without much attempt to straighten or arrange them, between the folded sheets, and crushed up in the portfolio. Plants that are wet with rain or dew are more apt to mildew or discolor than those collected in dry weather; but care will bring them out all right. Heavy, fleshy plants also need care, and may sometimes be split, as in the case of magnolias and thistles.

The materials for a press are two smooth boards, at least a hundred driers 11x16 inches, a quantity of single sheets of white grocer's paper of the same size, and a weight, of either a box of stones or five or ten bricks.

Very fair driers may be made of newspapers folded ten or twelve times to make thick pads, cut the uniform size and basted together at the edges. But by far the best driers are the felt pads sold for the purpose. They are absorptive in the extreme, and make perfectly even, smooth specimens. Although they cost about $2 per hundred, they are the best investment that an amateur can make, for they last for years and insure perfect specimens.

When the plants are to be taken from the portfolio, which should be as soon as possible, and not over twelve hours after gathering, they are put in press as follows: Lay a board as a foundation; on it a drier; on that a sheet of white bibulous grocer's paper; on that the specimens, which may now be straightened out and have some leaves turned over to show their under surfaces; on top of the specimens another sheet of white paper, then a drier, and so on till all are in, when the remaining board is laid over all and the weights put on.

In twelve hours the wet driers should be replaced by dry ones, while the wet ones are put in the sunshine or wind or behind a stove. The driers should be changed again in another twelve hours; and afterward once a day for three or four days, when most of the plants will be dry. Some plants do not dry in less than a week, and some are so persistently moist that, in desperation, they have to be ironed.

The whole secret of making fine specimens lies in having good bibuldriers, and in frequent and regular changes.

The regulation size of mounting paper is 11½x16½ inches. It is a heavy white glazed paper, about the weight of a very heavy note paper. It is worth about $1 per hundred, cut, but may be obtained for less if a local paper company has the right weight in stock.

Various means are used to attach the specimens to the sheet. Ordinary glue is useful for woody stems and heavy specimens, but the neatest and most satisfactory way is to fasten each specimen down by putting several strips of gummed paper across it. These may be prepared by covering one side of a sheet of linen paper, architect's paper, or even ordinary strong white paper, with mucilage, and, when it is dry, cutting it into narrow strips.

The plants should not all be fastened in the middle of a sheet, or the pile will soon curve. They should be distributed with a certain regard for artistic effect, in various positions.

The scientific name of the plant, with its authority, as well as the name of the collector, the locality, and the date, should be written either in the right hand lower corner of the sheet, or on a 1½x3 inch label bearing the collector's name.

Either before or after the plants are mounted they should be poisoned to prevent insects from eating them, by spraying them with alcohol or benzine in which a little arsenic has been disolved.

The genus covers for plants should be of a strong, heavy manila paper, cut so that when folded they are ¼ inch wider than the inclosed white sheets holding the species. In the lower left hand corner of these covers there should be written first the family name, and beneath it, close to the lower edge, the name of the genus—both in a strong, bold hand. In this cover all the species of one genus should be kept.

Of course all the genera of one family must be arranged together. In a small herbarium it is well to follow an alphabetic order.

No herbarium of over five hundred specimens can be managed easily unless kept in case. Closet shelves and drawers will serve at first, but not long. A good and inexpensive kind is made like a light bookcase, six feet high, with a partition down the middle and thin stationary shelves five inches apart. Each compartment must be large enough to allow the cover sheets to slip in lengthwise. Glass doors are a great protection from dust, but few amateurs have them. —*The Outlook.*

An Orchid for Room Culture.

A wonderfully pretty plant, well adapted for room culture, is the well-known Mexican orchid, *Cypripedium insigne.* In its native country it grows in the deep shade of woods, so that the obscurity of a dwelling house is rather agreeable to it than otherwise. Then it is in our country a natural winter-flowering plant, and needs no forcing to make it bloom. One plant will not yield many flowers; but they are almost fadeless. A lady of the writer's acquaintance has a plant, in an eight-inch pot, with seven flowers. These opened early in December, and lasted until the early part of February. The curious slipper-like lip, which has suggested the name *Cypripedium,*—that is to say the "Slipper of Venus,"—is always interesting. When the afternoon sunlight is shed on the flower, the colors are well brought out. It is a plant of the easiest culture, as all summer long it can be placed under the shade of some tree or wall. If it gets an abundance of water, it seems thankful; but if exposed to drought, it seems to enjoy life all the same. The plant above referred to had been in the same pot for many years.

Besides the interest derived from

the study of the curious and beautiful flowers, there is the additional one of testing the remarkable fact that orchids generally cannot fertilize themselves. The central portion of the orchid flower, which is technically known as the column, is a combined mass of stamens and pistils, with the anthers so placed that the pollen—which is arranged in solid club-shaped masses—cannot reach the apex or stigma without external assistance. One can easily find these pollen-masses. When placed on the stigma in this species, seed vessels follow in almost every case. The raising of the seed is a more difficult matter,—but to actually produce the seed is alone a pleasurable feat to the window-plant grower.—*Meehans' Monthly for March.*

Curious Forms of Money.

The cured skins of wild animals constitute one of the earliest forms of currency known, and while employed in the most ancient times, are not yet disused in some parts of the world. Such a medium seems appropriate among those who subsist by the chase, as all primeval peoples must in some degree, and it is not, therefore, surprising to find that, in the transactions of the Hudson Bay Company with the Indians, the unit of value by which the price of other articles is reckoned is the beaver skin. Attempts at a bidermatic currency, which should also include the skins of otters, may have been made among these conservative aborigines, but if so, they have always failed. Other skins, it is true, as well as those of the marten, the Arctic fox, and many others, pass readily in that northern commerce, but their ratio of value is conscientiously determined by the beaver skin,

In the Portuguese possessions of Angola, before the year 1694, the circulating medium consisted of small mats woven from a species of straw, and which the natives called libongos, Each libongo represented a value of five reis. The substitution of copper coin for this curious straw money came near bringing about a revolution, and was the cause of the death of many.

The shells of certain mollusks have long been used as money among some peoples, and among such shells may be mentioned the cowry, which constitutes the money of the natives of English India, the Soudan, the coast of Africa, etc.

The American Indians of the Atlantic coast made their money, or wampum, from the shells of the round clam and the columella of a species of Buccinum. The use of this money extended at an early period to the far West, and the people of this part of the country received it in exchange for the products peculiar to their region.

Upon the Pacific coast the money was often formed of a mollusk that is very abundant upon the coast of the Vancouver Islands, the *Dentalium entalis.* The shells, which are naturally perforated, were strong, and used as an ornament as well as for commercial exchange. The monetary unit was the fathom, which was calculated from the length of the arms stretched out on each side of the body.

The Indians of Bear River use, as money, disks cut from the very thick shell of a species of *Saxidomus.* These disks are perforated and strong, and the money thus manufactured is called *ha-wok.*

Among the islanders of Santa Barbara, the shells of *Olivella biplicata* are employed as money under the name of *kol-kol.* A good horse may be purchased for a string of these shells.

As a medium of trade among the aborigines of California, sea-ears or abalones (*Holiotides*) have been highly esteemed both for their beauty and their importance when used as shell money, the shells in the latter case being cut into strips of from one to two inches in length according to the curvature of the shell, and about one-third as wide as long. These were strung on a string and used both as money and ornaments. The string bore the name of *uhl-o* or *aulone.* As an illustration of the purchasing power of an abalone, it may be stated that in New Mexico a horse has been traded for a single shell.

From the reign of Henry I. down to the period of the establishment of the Bank of England, the legal tender money of England was fabricated out of wood. This instrument was called an exchange tally, and, by virture of it, the holder was entitled to receive from the Crown the value prescribed thereon. It really consisted of one-half of a four-sided rod or staff, on which, when in its entire state, the sum it purported to represent was carved in transverse notches, varying in width for thousands, hundreds, scores, pounds, shillings, and pence. These signs were for the unlearned. For the advantage of those who could read, the sum was written in ink on two opposite sides of the staff, and, finally, with a knife and mallet the staff itself was split in two, longitudinally. One-half called the tally or check, was given to the person for whose service it was intended; the other half, called the counter tally, was laid up for safe keeping until its correpsonding tally should be brought in by the person who had last given value for it. Its intrinsic value was, of course, only that of the wood of which it was composed, but, by representation, it denoted large sums. It was the current token of real money, and served actually to distribute it from man to man by this exchange.

From this primitive tally was derived the Exchequer bill, first introduced in 1696, by Mr. Montague, the Chancellor of the Exchequer. The word "bill," too, was no doubt derived from the old French "bille," which means a staff. Bank post bills and bills of exchange in our own day come from the same wooden base, and soldiers in England are still said to be "billeted," because formerly they tendered wooden "billes" or tallies to the victualers upon whom they were quartered. In olden times, officers of the army who were taken into the king's own pay were said to be put on the staff, that is, they were paid with exchequer tallies, or wooden money. —*Scientific American.*

Women in Botanical Honors.—The highest graduate in botany in the recent biological examination at the University of Pennyslvania, was a woman with an average of 100. The next, averaging 99, was also a woman. A man also received 99, the next in honors,—95, was a man.—*Meehans' Monthly for March.*

Houghton, Mifflin & Co., the publishers of the Atlantic Monthly, make an important announcement in regard to four papers upon Mars, by Percival Lowell, which are to appear in that periodical. Mr. Lowell made exhaustive observations at Flagstaff, Arizona, and these papers give the most recent information in regard to this remarkable planet. The first article is to appear in the May issue of the Atlantic, and is entitled The Atmosphere of Mars.

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Buffalo.....		8:55	10:55	1:25	5:15	8:45	

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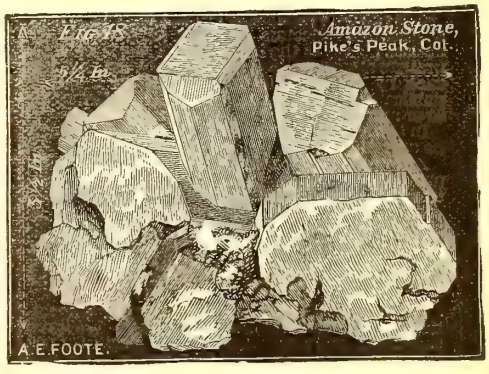

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All American books in print supplied on order. Foreign books obtained to order in a few weeks. Of the second-hand books on my list I have generally only single copies, but when sold I replace them as soon as possible.

When any book inquired for comes to hand, a memorandum, stating description and price will be sent. In our book catalogues the prices opposite the latest number supersede former prices usually where descriptions are the same. My arrangements for noting the needs of my correspondents are nearly perfect.

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FINALLY AND OF THE MOST IMPORTANCE.—We must especially request our customers to let us know of all mistakes and errors that may occur at our establishment. We can and will gladly rectify them at our own expense.

Broken Bank Bills.

I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c.

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MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Natural Science News.

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Only 5c per norpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

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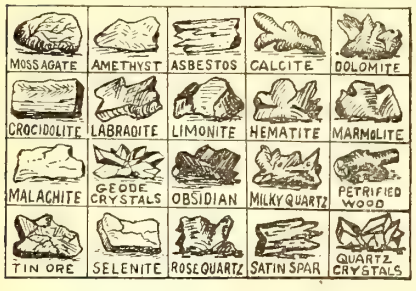

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Some material now on hand.

Parties desiring same should write us at once as it will soon go.

Scapiopus. A lot just secured—alive and prepared.

Turtles, Lizards, Snakes, Toads, Frogs, Salamanders, Bird and Mammal Skins and Skulls.

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Nelson's Preparation

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Sample Package, prepaid, only 15c.

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If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large, movable water drops, as large as peas; **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

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I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

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Natural Science News.

VOL. I. No. 13. ALBION, N. Y., APRIL 27, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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WANTED.—"Hawks and Owls" by Fisher. Will pay cash for same if in first class condition. Write price. WILL BURNETT, Box 9, Fort Collins, Colo.

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FISHER'S "Hawks and Owls." Apgar's "Key to Birds," Manton's "Taxidermy," "Masterpieces Am. Literature," back Nos. OOLOGIST, "Taxidermist," skates, climbers, etc; for good collecting gun. J. C. GALLOWAY, Montgomery, Ohio. O.

I HAVE a good guitar and case valued at $7 to exchange for books on Oology. Write quick and make me an offer. OLIVER DANIELS, Box 451, Kalamazoo, Mich. 13 2t

WANTED.—Egg collectors in every state in the Union. Those wishing eggs cheap send two cent stamp for catalogue. BARNES & HARDING, Chatham, N. Y.

ANY PERSON sending me either U. S. or Foreign postage stamps catalogued at $5, will receive in return 100 rare Chinese coins that are over 500 years old. C. M. HATFIELD, South Pasadena, California.

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PACKET of choice mixed flower seeds, for every good Arrowhead, Foreign Coin, Cabinet Specimen, Fossil, Crystal, or Opal sent me. FRANZ. TRIPP, Garden Prairie, Illinois.

WANTED.—Ancient stone Spear-heads, extra large, not less than five inches long, thin, fine and perfect. Send outline drawings, descriptions, data, and cash prices. REV. E. J. MITCHELL, 534 Summit Ave., St. Paul, Minn.

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FOR EXCHANGE.—Some Phrenological Journals, between 1873 and 1886; also a 4x5 Marvel camera for Indian Relics, and eggs not in Ohio. Will also exchange eggs. LESLIE L. COOKE, 565 Park Ave., W., Mansfield, Ohio.

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$5.00 will buy 378 varieties of foreign and native woods, or will exchange for printing press or woods not in my collection. LOUIS W. HAHN, Silver Creek, N. Y.

A 32 calibre hammerless revolver (nearly new) and a bicycle brake (new) for a search light bicycle lamp, or fishing tackle, or a good cyclometer in first-class condition. J. K. AUMACK, Box 907, Ballsion Spa, Saratoga Co., N. Y.

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I WILL exchange my entire collection of curios, value not exceeding $8. For books, for further particulars address, JOHN DOELLE, Box 192, Yale, St. Clair Co., Mich. 12-2t

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$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

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AMPHIUMA.

Some material now on hand. Parties desiring same should write us at once as it will soon go. *Scapiopus.* A lot just secured—alive and prepared.

Turtles, Lizards, Snakes, Toads, Frogs, Salamanders, Bird and Mammal Skins and Skulls.

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SELF-INKING RUBBER STAMP.

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10	varieties perfect Indian Relics	$ 90
6	" " " "	50
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" " "	25 " smaller	2 50
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Chalcedony Geode, new, and unique		25

Polished specimens of all kinds, sizes and prices.

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This is the time of year to mount objects of Natural History.

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Do you wish to learn an easy, simple method of mounting birds, mammals, &c., &c?

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MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J. M. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Broken Bank Bills.

I have lately bought a very large lot of these interesting relics. They usually sell for 10 cents or more per bill. I make a special offer of six different bills, from $1 to $10, all issued before the war, for only 25 cents. 10 different, for only 40 cents. Don't fail to send, you will be pleased. 2 Confederate bills sent for 10c. 50 different foreign stamps, 10c. 500 common U. S. stamps for decorating plates, etc., only 20c. J. E. HANDSHAW, Smithtown Branch, N. Y.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

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Sample Package, prepaid, only 15c.

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Natural Science News.

VOL. I ALBION, N. Y., APRIL 27, 1895. No. 13

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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The Palmetto.

There are two well known, indigenous species of the Palm family in Florida. These are the common or Cabbage Palmetto, *Sabal palmetto*, and the Saw Palmetto, *Sabal serrulata*. The former is a very graceful tree, usually from twenty to thirty feet high, which is found flourishing on the sandy coast as far north as * North Carolina; the latter has a procumbent trunk, and is found more abundant further south, being very plentiful in barren tracts in middle and southern Florida.

Both of these species have recently become factors in the industries of the Southern States, and cordage of an excellent quality is prepared from the Cabbage Palmetto, and the wood of the Saw is used for making a most serviceable and almost indestructible scrubbing brush for household purposes. The terminal leaves of the common palmetto or fans, as they are often called by the natives, when picked early, and while yet tender, are easily slit up lengthwise, thus forming long graceful fly brushes. The occupation is agreeable and the result a pleasing ornament, which may be made available. It is not uncommon to find a lot of northern tourists thus engaged; staid men vieing with the ladies in the production of artistic fly brushes for northern friends. Thousands of articles of this nature are carried to the north each season, nearly all of which are kept as ornamental curiosities by admirers, who would hardly care to use them for their intended purpose.

This terminal cabbage bud, which branches out a leaf or fan, once a month, * I am informed by a reliable observer. It is from ten to eighteen inches long and from two to four inches in diameter, and of a very dense substance. A careful dissection readily shows the leaflets or blades which are forming in tender succulent wrapper-like layers. The form and general make up is but slightly like that of the cabbage, and the palmetto, therefore rather gets its name from the resemblance in taste between the bud and cabbage. The taste of the raw vegetable is in no way disagreeable. It is rather nutty, and so tender as to require no effort in chewing, but there is a sense of rawness left on the palate which is not pleasant. The disagreeable features are largely overcome by preparing the bud, boiling, being the usual style of cooking it, but I am fairly convinced by experience that this vegetable will never come into prominence as a favorite dish. It is undoubtedly serviceable as an occasional makeshift to those whose gardens are not productive, but as a standby, I do not think that it will ever be a success.

The bears have the reputation of feeding on the bud, and it is claimed that they are very fond of it. How much truth there is in the bear story it would be hard to attest, but a reliable man told me that he had fed a captive bear some buds and it seemed to enjoy the treat amazingly. This man, of course, had to chop the trees down in order to get the buds, and it is reasonable to suppose that if a wild bear desired the cabbages, it would have to climb for them and dig them out. It is said that the removal of the central bud of the palmetto invariably kills it. If this is so, and the bears are much given to feeding on the buds, it necessarily follows that the Cabbage Palmetto would soon become a rarity in a neighborhood where bears are common, for, as the palmetto is a very slow grower, the supply could not equal the demands of the bears. However, it is fair to say that bruin does feed occasionally on palmetto cabbages as he is a decidedly omnivorous brute.

Notwithstanding that the palmetto is said to be quickly killed by cutting out its central bud, be the tree old or young, it is a very difficult tree to destroy, no matter how severe the injury to its bark. I have seen hundreds of Cabbage Palmettos from twelve to eighteen inches in diameter at the base, which had passed through several severe scrub fires. In all cases the outer coating, or what we would call bark in an exogenous tree, was badly burned away, and it was a common sight to find trees which were burned in to a depth of an inch. Some trees were eaten in all about their circumference to a depth of three or four inches, and often up and down for a space of 20 in. and yet even though ready to topple over, the green tops still proved their vitality. In some cases, where severe recent fires had devastated the neighborhood and the live oaks and other trees were nearly all dead, the charred and blackened trunks of the palmettos looked far worse than the other trees, yet the crown of green, though sometimes singed on its lower borders, towered proudly above, as a promise of life.

The growth of the Cabbage Palmetto, though slow, is exceedingly interesting. Its early development is not dissimilar from that of others of the spadiceous division, but so soon as a hard center, or what we may call the trunk is formed, a peculiarity is seen. Each successive petiole rising from the central bud, is in time provided with a broad basal attachment. The bud continues to shoot up from the center while the boots, as the stems are called by the southerners, continue to hang long, long after they are dead. And so persistent are they, that in time the green top of the tree may reach a height of twenty-five feet or more while the old, first stems still cling to the base of the trunk. In this way the tree trunk up to twenty feet or more, generally about fifteen feet, is covered with these dry, tenacious, fibrous stems. These boots, or basal ends of stems

* One of the leading features of the emblem of South Carolina is a Palmetto.

* From personal observations I cannot agree with this theory, for, although the leaves may appear monthly or oftener, in the summer, I can attest that they are much more tardy in February and March, and probably so throughout the winter.

at first, and when green, not above a few inches wide, become so stretched by the growth of the trunk that they split longitudinally, and always near the center at their base. In time they stretch or yawn several inches but still maintain their hold. The leaves fall in time, after two or three years of life at the most, I should say; the stem snapping off at from six inches to two feet or more from the trunk. This gives the young tree a very peculiar appearance, a look which is unlike any other.

If we could tell accurately how many petioles appeared each year it would be an easy matter to reckon the age of the young trees by counting the persistent stems. In time, even these tenacious, fibrous stems give way, beginning at the bottom and going upwards. The age at which a tree begins to drop its boots or base ends of stems, reasoning from a standard of one leaf a month in formation, or thirteen a year, is about sixteen years. It is fair to reason that this shedding of the inversely imbricated stems, begins before the tree has reached an age of twenty years.

The protection afforded by these stem-ends is apparently of no moment, as trees covered with them do not appear to suffer from the fire more than the older trees. In time the palmetto loses its imbrication of boots almost completely, and when this is accomplished it is fair to consider the tree at least a quarter of a century old.

In many parts of Florida the settlers build cabins of palmetto. The trunks form the frame-work and the leaves constitute an impervious thatch for roof and sides. These cabins, known as cabbage houses are very durable, and as they are cheap and easily constructed, are in demand in many wild quarters.

MORRIS GIBBS.

Lucanus dama.

Last summer, while hunting for tiger beetles on a small island in the Allegheny river, I noticed several large pinch beetles, (*Lucanus dama*) lying dead in the sand. I paid no particular attention to them at first, but as I soon found scores of them on all sides, in open sandy places, I started to investigate.

After closely observing several live ones, I found that they could not keep on their feet where the sand was uneven. As there were numerous hillocks and banks on all sides, they would slide or fall, and be unable to gain their footing in the yielding sand. As these beetles are nocturnal in their habits, they must soon die, being unable to endure the hot rays of the sun.

I found dead ones with small twigs in their grasp, and others that had succeeded in grasping something solid, but had apparently been too far gone, to make any progress after they had gained their natural position. Of course, a great many must have escaped, but I could easily perceive from the clumsy manner in which they struggled, that they never could regain their footing, when they were in a position with nothing to grasp but the treacherous sand.

I also found a few dead longicorn beetles, (*Prionus laticollis*) and (*Prionus umbricornis*).

JOHN BRIGHT,
Pittsburg, Pa

Exfoliation in the Tortoise.

In No. 9 of the NATURAL SCIENCE NEWS Dr. Morris Gibbs, who always chooses the right subject and has the happy faculty of telling us the very things which we most wish to know, discusses Exfoliation in the Tortoise and describes the desquamation of a domesticated *Cistuda carolina*.

The doctor says that so far as he can learn the process has never before been described. I have myself industriously consulted all the authorities at my command in a vain search for information, and his article is the first mention of the subject which I have seen. That exfoliation should take place in so common an animal and the fact never be mentioned by the many herpetologists who have written about this species might well seem incredible, and the traditional men who carve their names and dates on "terrapins'" backs and have the inscriptions read by their grandchildren will probably request the Michigan naturalist to send in his affidavit.

We must remember, however, that books usually represent the vegetarian *Cistuda* as feeding on worms and insects, and that people, sane in other ways, sometimes, keep them in their cellars to catch rats and mice. Frederic W. True, in "Natural History of Aquatic Animals," page 158, alludes to this and sagely adds "but it is doubtful whether so sluggish a tortoise would be able to capture so nimble a rodent as a mouse," Those who have kept the animal in captivity and seen it eat lettuce, cabbage, potatoes and like Dr. Gibbs' "Dick," celery, will think Mr. True's doubt well founded.

General ignorance of the matter, then, cannot be taken as evidence that Tortoises do not at times discard their old shells and grow new ones, and I am inclined to believe that this takes place periodically. I have at various times found box tortoises with thin horn colored layers loosened and ready to peel off from their epidermal scutes, the layer from each scute peeling off as a separate piece.

When I first kept a *Chrysemys marginata*, or "Western Painted Tortoise," I found that the animal had rough places in each of its scutes, as if the shell had been fractured in various places. The rough edges around these apparent fractures gradually peeled away, falling off in small flakes, until by very slow degrees the whole surface of the carapace had been discarded and renewed. I thought that this proceeding might have been the result of some accident, but having since observed the same thing in other individuals of the same species I am satisfied that the process is a normal one.

I have often found specimens of the *Malaclemys geographica* and of the *Malaclemys pscudo-geographica* with shells so dingy in hue that the usually bright and distinct "map" markings on their backs were so obscured that it would have been impossible to distinguish one species from the other by these markings alone. On rubbing the shells of such dingy specimens I generally found that the surface of the scutes would peel off in sections about as thick as a finger nail, leaving the colors of the new shell bright and distinct. From each marginal scute the upper and lower surface would come off in one piece. These observations were made in the late summer, though I am not by any means sure that that is the only season in which the Tortoise may discard the effete portions of his shell.

For my own part I find it quite reasonable to suppose that a tortoise might, under unnatural conditions or affected by some disease, throw off more of his shell than he does in a state of nature, and the phenomenon witnessed by Dr. Gibbs makes this belief a certainty.

Common report would have us believe that snakes shed their skins once each year, and that punctually in the middle of August, when in fact the frequency of their exfoliation is altogether dependent on their age, condition, and the food supply.

When they come out of their winter quarters in the early spring they are much emaciated and are so dingy and dirty that their natural colors are obscured. Assembling often in considerable numbers, in some sunny sheltered spot, they obey the promptings of the race instinct, and provide for the continuation of the species. Then if food can be obtained they gorge themselves, lie hid for a week and come out again to discard the dingy cuticles which they wore through the winter and to appear bright and clean in new and shiny spring suits. It often happens, however, that little or no food can be found at that season and the process of exuviation is accordingly much retarded.

I have known garter snakes, *Eutaenia sirtalis*, to go two years without shedding, because they were kept under such unfavorable conditions that their existence was nothing more than a living death and they could not properly perform the functions of healthy life. Snakes of the same species kept by myself shed at least three times each year, and one, which was growing rapidly, shed five times in a little over three months. Of course, older snakes would not outgrow their coats and would not change so often.

I have noticed the young of the *Heterdon platyrhinus* shedding their skins after they had been out of the shell but a few hours, while the young of *Eutaenia* would gorge themselves on earthworms, *Lumbricus* and wait six or eight days before exuviation would take place.

In considering the question of exfoliation in the tortoise observers need not be alarmed if their reports do not coincide regarding the date and manner of its occurrences for chelonians are no doubt as much subject to variations, and to the influence of food and surroundings as ophidians.

ANGUS GAINES,
Vincinnes, Ind.

Queries.

An Ohio subscriber queries as follows:

1. What is the use of the bony case in ducks, at the junction of the bronchiae and trachea?

2. What are the white thread-like worms, one to two inches long, often found in considerable numbers back of the eye-balls in owls?

3. From what trees are caboo, cocoa and coco bola woods obtained?

4. Is Prof. D. S. Jordan correct when he states that the voice of the Cricket Frog, *Acris gryllus*, resembles the rattling of pebbles?

Late Arrival of our Birds; What Became of the Bluebirds?

The notes given by Mr. Watkins in NATURAL SCIENCE NEWS of April 6th, apply equally well to this locality, with the exception of the dates. My notes show the arrival of our spring migrants to be from five to thirty days later than last year. The average difference being about two weeks. I have observed eighteen species so far this year, only twelve being regular spring migrants.

My notes of 1894 and 1895 compare as follows:

	1894	1895
Robin,	March 8,	March 19
Bluebird,	" 8,	" 25
Song Sparrow,	" 10,	" 25
Wild Ducks,	" 20,	" 25
Marsh Hawk,	" 24,	" 30
Phœbe,	" 19,	April 3
Purple Grackle,	" 8,	" 7
Chippi'g Sparr'w,	" 24,	" 5
Meadowlark,	" 20,	" 9

About the first of February a Red-throated Loon was brought to town here. It had been found waddling in the snow unable to fly, and completely exhausted, near a small creek of running water. At about the same time were found three Grebes, near the same place and in a similar condition. One of them flew away and the others were caught, and I believe, mounted. This was during a cold snap, following a thaw. It seems probable that the migration had commenced then, and being checked by continued cold weather, many "early birds" perished with the cold, and the migration was unusually delayed.

BERTON A. GARRETT
Ballston Spa., N. Y.

A sample copy of NATURAL SCIENCE NEWS came to me today and I find a man, L. Whitney Watkins, has been worrying about the late arrival of the birds as well as I. The Bluebird especially was so much behind time that I wrote Dr. Merriam of the Dept. at Washington, D. C., for an explanation. Not that I suspected the Dr. of holding them back, but thought he might be able to trace them from their southern home.

He writes me that all the birds were driven further south this winter on account of severe weather. This is doubtless the true explantion.

With us, here, near the shore of Lake Erie, the Bluebird, for the last ten years, has arrived, on an average about March 1st. The earliest arrival was Feb'y 5, 1890, the latest before the present spring was March 5, 1886.—This spring, only one male so far has arrived and that, April 13th.

The Brown Thrasher, Chewink and many birds of passage have already arrived. But still we miss that cheerful little song of *Sialia sialis*.

W. B. HALL.
Wakeman, Ohio,

Bluebirds were very late arriving here this year and are very scarce now, and in other parts of Iowa from which I have heard. A report on the Bluebird from all over the country would be of very great interest, and especially if from near their winter habitat.

J. H. BROWN,
Iowa City, Ia.

You would greatly oblige me by bringing before the large circle of readers of the NATURAL SCIENCE NEWS the following query:

What became of the Bluebirds? Not one-tenth of our Bluebirds have returned to their breeding places in this neighborhood, and the time is now over when hope for return could reasonably be entertained.

It used to be a common breeder until this year; now it is a rare bird and, though I have been out many times and in different directions in this and the adjacent county, the Bluebirds which I have seen or heard can be counted on the fingers of my two hands.

What is the cause of their absence? Have they perished, and how? Let us try to find out as much of this calamity as possible.

We have had hard winters before; the February of '86 was as cold or even colder all through the Southern states; snow fell at the mouth of the Rio Grande and men froze to death in the bay of Galves-

ton, but the Bluebirds returned all right when spring came.

Our Robins, too, are greatly reduced in numbers and up to date I have not yet seen a single Yellow-rump, though they are usually plentiful by this time.

All the Fringillidæ which winter in the Southern states do not seem to have suffered much loss, and the Thrashers, Bewick's Wrens, Chippies and Sycamore Warblers came back in full numbers.

O. WIDMANN.
Old Orchard, Mo.

Our first Bluebird, a single specimen, was noted on April 7th. Since that date only a single pair has been recorded, ordinarily the Bluebird is one of our most common species.

Other birds, although belated, have returned in, apparently, their usual numbers—the Robin is unusually abundant.

Mr. J. Rowland Nowell, on page 39 of NATURAL SCIENCE NEWS, April 6th, answers most conclusively what became of *some* of our Bluebirds, and it's barely possible that the non-appearance of untold thousands may be attributed to the same cause.

Until otherwise proven, it will be well for the bird-lovers of our land to adopt this pessimistic view of the bluebird question, and during the ensuing season consider it their special duty to see that every bird and every nest of this species be most rigidly protected.

Without this precaution our Bluebirds of *today* might through the ubiquitous "small boy," embryo naturalist, and other agencies, both natural and otherwise, place this species in a rank with the Passenger Pigeon and possibly with the Great Auk and Labrador Duck.

This alarm note we trust is uncalled for and the illustrations overdrawn, however it will be conceded by all that "an ounce of prevention is worth a pound of cure."—*Ed.*]

A Two-headed Snake.

I wonder how many of the readers of NATURAL SCIENCE NEWS have ever seen a two-headed snake. I can safely say but few. In fact I doubt if more than five; such was my pleasure not many days ago. This freak is a common black water snake, not over twelve inches long, and was born in captivity with twenty-eight others last spring. Consequently is now pretty near a year old. Head number one is situated the same as any ordinary snake's head is, while head number two is about one-half inch below it on the left hand side, and forms a right angle with head number one.

Both heads are alive and it is a very peculiar sight to see both tongues darting back and forth at the same time. It eats with both heads and does not seem in the least bothered with its odd head. In the winter when given a pan of ice cold water it would get into it and swim around without the least hesitancy, and was as lively as any snake I have ever seen. This freak is owned by Mr. G. Smith, who is justly proud of his pet.

J. B. CANFIELD,
Bridgeport, Ct.

To All Michigan Observers.

In the April OÖLOGIST, and also in the NATURAL SCIENCE NEWS, reference was made to the formation of our Michigan Academy of Sciences, and an invitation extended to those disposed to join.

Many responded to the request for observations on our State Birds, and we are promised aid from all quarters of the State, though of the many observers in Michigan, a number have not complied by letter, as yet.

It is now time to begin observations, and the following suggestions are offered to those who wish to gather Michigan notes, and materials for the "M. A. S."

General observations on arrivals and departures are solicited and which are to be kept after the manner of the observations for the Government Department at Washington. But in addition to general notes, it has been suggested that a special family should be studied in a thorough manner. After deliberation it has been decided to give our principal attention to the Warblers.

There are thirty-six species of warblers known in Michigan, and one variety. The listing of the Yellow-throated Warbler, *Dendroica dominica* (L.) in Cook's Birds of Michigan, 1893, was an error.

Of these representatives of a most interesting family, twenty-eight are common and well known to all advanced collectors, and twenty two are abundant. Twenty-one are known to breed in the state, and the nesting habits of seven are known to nearly all observers. Four species are stragglers only. Seven or more are locally distributed, and not found in many sections. Five are thought to pass north of our boundaries to nest. Seven are known to remain in the state in summer, yet are not known to breed.

Notes should be taken at each station as follow:

1. Date of arrival of first male and female. Date when common. Date at which last specimen of those who pass north was seen. List of summer sojourners.

2. Date of first song. Description of songs and call notes, expressed in syllables. Preferred time of singing. Date of cessation of song.

3. Date of earliest nest building. Date of completion. Complete description of nest; dimensions; exact situation; with name of tree or bush, description of locality, wood, or field, marsh or highland. Full notes on material of nest structure, outside, inside and lining. Weight of nest (*avordupois*)

4. Date of first egg deposited. Date Position of the first full set. Position of the eggs. Number of the eggs. Date of hatching of brood. Take careful note of date of deposition of egg of Cowbird, and length of period of incubation of Warbler and Cowbird.

5. Date when young leave the nest, with special mention of the time when the young Cowbird leaves.

6. Habits of old bird during incubation and care of young. Food of the young. Food of the old birds.

7. Description of eggs.

8. Date of departure, with remarks on changed appearance from moulting. Date of appearance of northern transients.

9. Other notes which will be suggested to thoughtful observers by the birds.

These observations, if generally and systematicaly taken, will secure to us a better understanding of the Warblers of Michigan than has been our fortune thus far. This State has not received the attention from thorough workers which its interesting avi-fauna would seem to invite, and no concerted systematic work has ever been accomplished.

Systematic observations cannot fail to be of interest to each worker in a locality, while the value of a compilation of these notes will be of the greatest assistence in future research. To those who wish to study other families or groups of birds, and to all collectors of skins and eggs, we would say that the Academy will be pleased to receive your observations, as well as specimens which you may wish to offer.

Michigan Academy of Sciences,
MORRIS GIBBS, M. D.,
Department of Ornithology,
Kalamazoo,
Michigan.

[These suggestions are so good, that we cannot do better than to advise collectors of other states to follow them in conserted action and later secure compilation of the season's efforts. It is only by this means that our best work is accomplished.—*Ed.*]

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Albion	6:50	7:00	9:00	11:35	3:25	6.50	11:06
Lockport		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:35		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:10	1:40		5:50
Susp. Bridge .	6:45	8:10	11:20	1:48		5:55
Lockport.....	7:30	8:50	12:00	2:25	5:55	6:35
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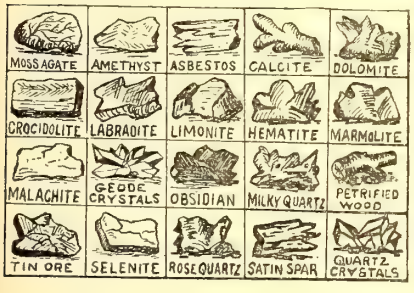

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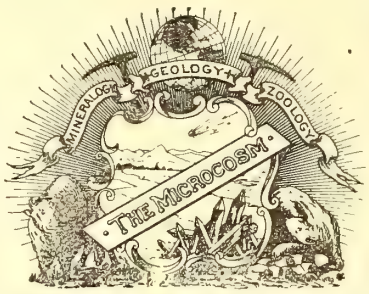

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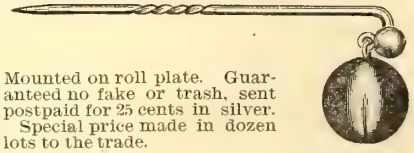

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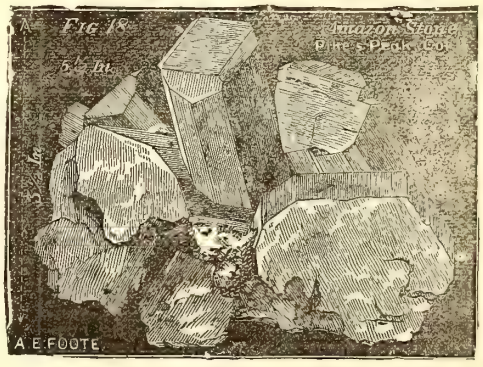

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QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophyllite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

FROM THE "COPPER QUEEN" mine in Arizona, we have just obtained the most beautiful, gem-like crystals of **AZURITE**, which with tufts of velvet **MALACHITE** are scattered over stalactites of Wad and Limonite. The crystals exhibit a new habit and their arrangement over the Limonite surface is most novel and striking.

Also, *Cuprites* in large octahedrons: delicate blue *Chrysocolla; Stalactites* with an exquisite tinting of pale sea-green color.

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Natural Science News.

VOL. I. No. 14. ALBION, N. Y., MAY 4, 1895. Weekly, $1.00 a Year

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Rochester.....	5:55		8:00	10:30	2:20	5:35	10:00
Albion	6:50	7:00	9:00	11:35	3:25	6:50	11 06
Lockport		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	1.:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
Albion.....	7:05	8:20		1:00	3:25	6:45	7:55
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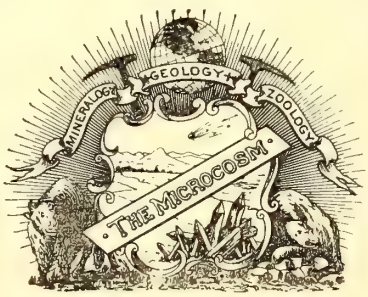

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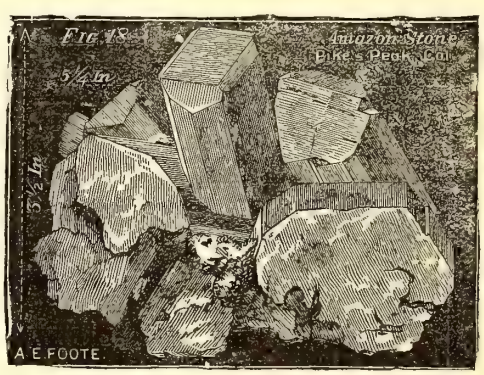

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Natural Science News.

VOL. I ALBION, N. Y., MAY 4, 1895. No. 14

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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In this issue of NATURAL SCIENCE NEWS we publish the substance of Prof. Wilson's "Camp Agassiz" announcement.—Although we have corresponded and had business relations with Prof. W. for nearly fifteen years and can give him and his scheme our unqualified endorsement—we publish the matter trusting that his enthusiasm and ideas may prove contagious and become prevalent to such an extent that during July and August well organized and systematized Natural History Camps will be found by the hundreds scattered abroad this fair land of ours.

James D. Dana.

In the death of Professor James Dwight Dana, America has lost one of her greatest scientific men.

The celebrated mineralogist and geologist passed away after an illness of only a few hours at his New Haven home on Easter Sunday, April 14, in the eighty-second year of his age. He was born in Utica, February 12, 1813. His early education was obtained at school in his native place. In the autumn of 1830 he entered Yale College and graduated three years later, after which he was appointed professor of mathematics to midshipmen in the United States Navy. In the two years he held this position he visited France, Italy, Greece and Turkey. In 1835 he returned to New Haven and became assistant in chemistry to Prof. Silliman. He was engaged at this time in the preparation of his "Treatise on Mineralogy," the first edition of which was published in 1837. This work was the first of his remarkable writings which were to mark an epoch in the history of natural science. In 1836 he received the appointment of mineralogist and geologist to the exploring expedition sent by the United States to the Southern and Pacific Oceans. The Peacock on which he sailed, was wrecked at the mouth of the Columbia River. In the three years and ten months which he spent on the trip he visited Maderia, Rio de Janeiro, Terra del Fuego, Valparaiso, Callao, Tahiti, Samoa, Australia, the Hawaiian Islands, the Feejee group, Manila, Borneo, Singapore, Cape of Good Hope, St. Helena and many other places. Besides the mineralogy and geology of the expedition, Mr. Dana had under his supervision the zoological department, including the crustacea and corals. The rare opportunity which this voyage afforded for scientific observation had been well improved, and for thirteen years after his return he was engaged principally in studying the material that he had collected, making drawings and preparing reports for publication. From 1842 to 1844 he lived in Washington. In the latter year he removed to New Haven, where he married Henrietta Frances, third daughter of Prof. Silliman.

In 1850 Mr. Dana was appointed Silliman professor of natural history and geology in Yale College, succeeding his father-in-law, but he did not enter on the active administration of the chair until 1856. The title of the professorship was changed in 1864. Mr. Dana became associate editor of The American Journal of Science and Arts, and after Professor Silliman's death, its senior editor. Contemporaneously with his duties as a lecturer and editor, Prof. Dana prepared his well known text books on mineralogy and geology. His "System of Mineralogy" grew in size from 452 pages in 1837 to the editon of 1892, which contains 1,197 pages. The "Manual of Mineraloly," a more elementary work, has also a deserved popularity. These books, with his "Manual of Geology" and "Text Book of Geology" are recognized as standard throughout the world, and are used as text books and works of reference wherever the sciences of which they treat are taught in the English language. His writings on the coral islands include "Coral Reefs and Islands" (1853) and a second edition of that book which was published in 1872 under the title of "Origin of Coral Reefs and Islands." His separate papers include hundreds of titles. Many honors were paid to Mr. Dana. He received the degrees of Ph. D. and L. L. D. The Geographical Society of London, conferred on him its Wollaston medal in 1872 and in 1877 he received the Copley gold medal from the Royal Society of London. He was also a member of the chief scientific societies of America and Europe. Prof. Dana retired from active work at Yale two years ago, but has given private lectures and instructions at his home and gave invaluable advice on the subject of geological and zoological matters in the Peabody Museum.—*Sci. Am.*

Great Gold Nuggets.

The largest piece of gold, free of quartz, in the world was taken from Byer & Haltman gold mining claim, Hill End, New South Wales, Australia, on May, 10, 1872, its weight being 640 pounds; height four feet nine inches; width, three feet two inches; average thickness, four inches, and was worth $148,800. It was found embedded in a thick wall of blue slate, at a depth of 250 feet from the surface. The owners of the mine were living on charity when they found it.

The Welcome Stranger nugget was found on Mount Moliagel, February, 9, 1869, it weighed 190 pounds and was valued at $45,000 It was raffled for $46,000.

The Welcome nugget was found at Bakery Hill, June 9, 1859; it weighed 184 pounds 9 ounces 16 pennyweights, and was worth $44,356. It was raffled for $50,000.

The Lady Hotham nugget was found in New South Wales, Canadian Gully, September 8, 1854; it weighed 98 pounds 10 ounces 12 pennyweights, and was sold for $23,557.

The Union Jack nugget was found February 28, 1857; it weighed 23 pounds 5 ounces, and was sold for $5,620.

No name nugget was found at Eureka, Dauttons Flat, February 7, 1874, at a depth of thirty feet

from the surface; it weighed 52 pounds 1 ounce, and was sold for $12,500.

The Leg of Mutton nugget was found at Ballarat, January 31, 1853, at a depth of 65 feet; it weighed 134 pounds 11 ounces, and was sold at the bank for $32,380. This nugget was shaped like a leg of mutton, hence its name.

No name nugget was found at Bakery Hill, Ballarat, March 6, 1855, near the surface; it weighed 47 pounds 7 ounces, and was sold for $11,420.

No name nugget was found in Canadian Gully, Ballarat, January 22, 1853, near the surface; it weighed 84 pounds 3 ounces 15 pennyweights, and was sold for $20,235.

The Kohinoor nugget was found at Ballarat, July 27, 1860, at a depth of 160 feet; it weighed 69 pounds and was sold for $16,686.

The Sir Dominic Daly nugget was found February 27, 1862; it weighed 26 pounds, and was sold for $6,240.

No name nugget was found at Ballarat, February 28, 1855; it weighed 30 pounds 11 ounces 2 pennyweights, and was sold for $7,395.

No name nugget was found August 1, 1879; it weighed 12 pounds, and was worth $2,280.

No name nugget was found at Ballarat, February 3, 1853; it weighed 30 pounds, and was sold for $7,360.

No name nugget was found in Canadian Gully, January 20, 1853; it weighed 93 pounds 1 ounce 11 pennyweights, and was sold for $22,350.

No name nugget was found at Bakery Hill, March 6, 1855; it weighed 40 pounds, and was worth $9,600.

The Nil Desperandum nugget was found November 29, 1859; it weighed 45 pounds, and was sold for $10,800.

The Oats & Delson nugget was found at Donolly gold field in 1880, at the roots of a tree; it weighed 189 pounds, and was sold for $50,000.

In addition to the above are the Huron nugget, worth $20,000 and the Empress nugget, worth $27,661. A great number of smaller nuggets, too numerous to mention, have been found.

Many large nuggets or lumps of gold have been found in California during the era of placer mining; but Australia must claim the largest. The California lumps are as follows:

A piece of gold and quartz was found in Calaveras County, on Carson Hill, on the mother lode; it was valued at $42.000.

The Downieville lump of quartz and gold, of Sierra County, as stated by Louis Blanding, gave a value of nearly $90,000; but it was not a nugget.

The mass of gold and quartz found in the Bonanza mine, Sonora, Tuolumne County, gave a value of over $40,000.

The Australian statistics are correct, I having obtained them from government authority.—*Argus, in Mining and Scientific Press.*

Snakes.

The heading of this article is one to command the attention of all, and it may safely be asserted, that of the many readers of the NATURAL SCIENCE NEWS, few if any will pass it by without, at least glancing over the truths uttered below. It is also a fact that nearly all will begin the perusal of this veracious account firmly believing that it, like many, many others, on the same subject, is a fabrication of untruths so commonly appearing in print. Allow the writer to say in justice to himself, that no one is more skeptical in regard to the many incredible stories than he is at present.

To those disbelieving the accuracy of the following statements the writer would say, that disbelief is only natural, and he expects nothing better than expressions of incredulity from those who cannot fathom *Ophidian* peculiarities, from inability to investigate or from sheer laziness. To that class of shiftless observers and cronic prevaricators who will shower calumny and contempt, nothing need be said, except, that truth will be told, and not varied from one jot.

In investigating in any department of natural history it is best not to allow one's good opinion of any narrator to influence one in the belief or disbelief of a yarn. Some of the most ridiculous tales that I have listened to, came from the lips of friends in whom I would have placed the utmost confidence in all they asserted excepting snake squibs. For years I have turned a deaf ear to the truly marvelous stories in circulation; and observations only of the most reliable parties, those interested in scientific investigations, have been listened to.

There is probably no subject within the domain of zoology, which is more fully written of, and unfortunately in a far from accurate and reliable manner than the subject of reptiles as a whole, and snakes in particular. There is some reason for this, and yet it would be difficult to ascribe it properly, and to suit the majority of my readers in defining the cause of this preference. However, I feel safe in ascerting that one, and the chief source, is from our universal love of the marvelous. We understand so little about snakes, they are almost a mystery with many; they are credited with peculiar powers of charming, and almost invariably, with either poison in fang, breath or tail, that it is hardly to be wondered at that the ignorant are usually foolishly prejudiced against the crawling creatures placed upon the earth to form a part in nature's economy.

It should not be understood that the word ignorant is here applied to the illiterate alone, as people well informed on many matters pertaining to books are grossly ignorant regarding our lower animals. In addition to the natural aptitude with which we all, as children, acquired, those little likes and dislikes from imitation of our elders, we are constantly reading amazing yarns in various papers and periodicals; stories of such exaggeration, that to an observer it really is a mystery how level-headed editors can consistently allow this class of fabulous literature to continuously appear in their columns.

These constant, fabulous stories, in addition to early training, are undoubtedly, fully accountable for the extreme repugnance almost universally felt by old and young. Perhaps the general dread of all snakes prevents a few deaths from the bites of poisonous species.

To those who study our legless friends, however, the graceful creatures are a constant source of pleasure, and with the power of discrimination, the poisonous species are avoided and the innocuous kinds handled and studied at will. As a proof that the repugnance exhibited toward reptiles is the result of education and not instinctive I may in another paper mention the attachment existing between a snake and its master, and the playful attitude evinced by my three year old baby girl who with perfect freedom picked up and carried about several small snakes which I had in captivity.

It is not generally acknowledged that snakes are of any use on the face of the earth and they are killed on every occasion that permits,

but it is most conclusively proved, so far as my observations extend, that they most certainly do fill a proper position in the animal scale. Prejudice goes a great way in our opinions of the various animals of our land and it is not reasonable to be governed by popular opinion in many cases.

There is a way of telling rattlesnakes and other poisonous species in the United States by a very simple examination, and which is invariable and satisfactory. If any poisonous species of snake is captured, a moment's glance will convince one as to its virulent nature. A deep pit is found between the eye and nostril just above the mouth. This pit is of an irregular shape and as large in diameter as the ordinary school slate pencil and nearly half as deep in the large rattlers. In smaller specimens of Massasauguas it is not over one-half a line in size. It is found in the Moccasin and Copper-head as well as in all the varieties of rattlesnakes. Of course it is not advised that a snake be examined alive to ascertain if it is poisonous.

Those who really know the different species can readily tell by many marks, while those who have no knowledge of serpents, will, from the natural feeling of repugnance refuse to handle a live snake.

The question of the poisonous nature of a dead serpent will however come up in every man's life, and anyone can tell to an absolute certainty by the above well defined pit. If it is absent the snake, if a native of the United States, is innocuous.

Morris Gibbs, M. D.

Cement for Mending Shells.—Gum Arabic, ten parts; sugar candy four parts. For large and heavy shells: Resin, eight parts; bees-wax, two parts; plaster of Paris, ten parts by weight. Melt all together. Slightly warm the fractured edges of the specimen, and apply tne cement. The cement must always be heated a very little before using. All superfluous cement may be scraped off when hardened.—*Random Notes.*

Insect Collecting.

This is a subject about which much has been written, and there are many different ideas about the methods used, so that something new may be gained from each writer, I have been asked many times, what poison I used, and how I made my lure for night collecting. My experience may develop some points that will be of advantage to others.

The first thing to be thought of is the poison to be used to kill the specimens, Some have a preference for ether, others for cyanide of potassium. I find that the best chloroform is by all odds, the safest, cheapest in the end, and produces better results than any other poison. Ether requires a longer time ta kill than chloroform, while cyanide will not answer with many of our delicate-colored insects unless they are removed from the collecting bottle very shortly after being caught, for if left in a minute too long, the powerful poison will act on the delicate coloring matter and either completely destroy it or render it several shades lighter, thus spoiling the insect as a specimen. And what collector would wish to stop, should he be on the jump for an hour at a time, in a locality where insects are plenty, and no time to pause without the risk of losing some rare specimens, for it takes but a few minutes to spoil a specimen, so quickly does the cyanide eat into the tissues of the body and wings. It answers very well on our larger coleoptera, as they are very hard to kill, but even then, care has to be taken, for it is dangerous to handle, or even to breathe the fumes, as it is, with one exception, our deadliest poison. I have used chloroform for several years, and it has given me the best of satisfaction, with no danger in the handling. Cyanide stiffens the muscles of insects so that it is very difficult to set up a specimen after being killed, even if it is softened by exposure to steam; while chloroform merely stiffens them for a few moments, they quickly relax, and can be set up with ease several hours after being killed. I have had some of our most delicately colored moths soaked with chloroform in a collecting bottle for nearly half a day, and within two minutes after their removal the chloroform would evaporate, and the colors come out as bright and clear as in life, and even after remaining in my cabinet for years, show no change in color, and for this reason I am inclined to think that it tends to fix the coloring matter, instead of hurting it.

Experience has taught me that few boxes and bottles are necessary, unless for an extended trip of several days. For a hunt around the suburbs of the city, I provide myself with a folding net, with a handle about four and a half feet long, for lepidoptera, a large-mouthed bottle holding a half-pint or so, and a smaller one for coleoptera, for in dying, the hard bodies and sharp tarsi of the beetles are apt to injure the wings of moths and butterflies, when put in the same bottle. Then, with a half dozen small boxes of different sizes lined with cotton, and a "digger" (a broad-bladed old chisel) for working around stumps and trees, I am fully equipped. The chloroform I carry in a small vial in a vest pocket. In preparing my collecting bottle, I cut three thicknesses out of cotton batting to fit inside the bottle, and glue lightly around the edges to prevent slipping, and when on the ground I pour ten or more drops of the chloroform on the cotton, renewing it in about an hour. When I have a number of insects in either bottle, I remove them to the boxes and add to the same until they are full, for I find there is less danger of damaging specimens when closely packed than when only two or three are placed in each box. Paper cut for the purpose is a good thing to carry for large, fine specimens.

For a lure for night collecting, I have found that the best is made with a pint of ale or beer, either fresh or stale with about a pound and a half of dark brown sugar thoroughly dissolved in it. Many collectors put the lure on the trees in the daytime and then collect from them in the evening; but I have found that when this is done the ants, those pests of insect society, will generally cover the lure before I am ready for work at night, and in such numbers that it is impossible for a moth to alight. About sunset I lure eighteen or twenty trees, putting one or two brushfuls of the lure on each, and then, after waiting fifteen minutes or so, find that it works to a charm. For a lantern I use a large size "bull's eye." The best nights for collecting with the lure are those in spring when the weather is what we call "muggy." In the spring of 1883, when collecting from a lure, I captured 120 moths, besides a number of beetles, from a clump of eleven trees. The moths caught in spring are mostly the Noctuids and Geometrids.

Night collecting with lure can be commenced about March 1st, and continued until the flowers bloom; then taken up about the middle of August, when our beautiful catocala moths can be taken in considerable numbers, besides many of our rarer Geometrids. I find that it is almost useless to lure the walnut or hickory tree, as very few insects will be taken from them, for what reason I cannot explain. If there is any tree where the sap is running freely in the spring, either from an abrasion of the bark or a cut from an axe, don't neglect visiting it day and night, as many insects will be caught thus which would not visit a lure.—*F. E. Gray, in Random Notes.*

May Insects.

In this month the hibernated legion is warmed to new life, and the number of species occurring is too great to warrant special indication. The large Tiger Swallowtail (*Papilio turnus*) darts swiftly about, while a lot of humbler butterflies are seen. Those gigantic beauties of the night, the Cecropia moth (*Platysamia cecropia*) and the Polyphemus moth (*Telea polyphemus*), are seen hanging listless as they just issue from their cocoons. or pass bat-like at dusk overhead.

Some of the hawk-moths(*Sphingidæ*) already begin to hover at twilight over honey-yielding flowers. The Carpenter moth (*Xyleutes robiniæ*) will be found early in the morning, resting on the trunk of the black locust, from which the empty pupal exuvium sticks out as an index. A host of Hymenoptera make their advent; and noticeably the giganticSaw fly(*Cimbex americana*) will be found ovipositing in willow leaves, and the pigeon Tremex(*Tremex columba*)in old maple trunks. The Buffalo-gnat (*Simulium*) swarms in the lower Mississippi country. The fruit-grower finds the Plum Curculio (*Conotrachclus nenuphar*) making its dreaded crescent-mark on his fruit, and the Canker-worms blighting his apple-trees. The housekeeper observes with dread the various clothes-moths (*Tinea*) and the carpet-beetle (*Anthrenus scrophulariæ*). But the latter part of the month is chiefly characterized, first, by hosts of delicate May-flies (*Ephemeridæ*); second, by the swarms of May-beetles (*Lachmosterna fusca*), which begin to defoliate oak-groves and poplar trees.—*Science Almanac.*

Camp Agassiz.

A Summer Home for Boys Devoted to Natural History and the Pleasures of Camp Life.

If you have a boy, you know how he likes to get out of doors and tramp across the fields or through the woods to go fishing and hunting, or, best of all, to camp out. The average boy shows this liking so early in life that it must be born in him, And if so, it's bound to develop, for boys will be boys,do what we may. Therefore it rests with us who are parents to find out how they can get the greatest good from it. Fortunately a month or two out of doors every year, under suitable precautions, will go farther toward keeping a boy healthy and vigorous than all the nostrums ever invented. This is certainly one great advantage, but it seems to us there may be another.

Most boys have also something of a naturalist's love for the beings they find in the woods, the fields and the water. They take great pleasure in making collections of insects, shells, minerals, birds' eggs, and what not. This liking is also inborn, but needs guidance even more than the former. When properly cultivated, however, it can be made just as conducive to mental health and vigor as can the other to physical. Realizing these facts, we venture to combine them in the manner herein announced.

Camp Agassiz is on the coast of Maine, in the town of Harpswell, a little to the east of Casco Bay.

Steamers run to Portland twice a day, from a wharf some two miles below the camp, insuring prompt delivery of mail and all needed supplies.

The situation is an ideal one for Natural History work. The shore is quite heavily wooded and thus furnishes, with the adjacent islands, a fine breeding ground for all our smaller birds, notably the warblers and shore birds. It thus offers special advantages for practical work in Ornithology and Oology.

□ Then there are many old Indian shell-heaps along the coast, easily accessible, and in which a little digging is almost sure to yield good results in relics of various kinds.

The marine life is abundant and of peculiar interest, since this is a sort of borderland. It is the northern limit for some species, and the southern for others, and thus presents a wide range of forms.

It is a good section for Botanical study also, combining maritime with inland species.

The Camp itself consists of a snug little cottage, well furnished throughout, and capable of accommodating ten or a dozen boys. This will be used as a headquarters, and will insure shelter in stormy weather and a safe storage for utensils and specimens. At a little distance on the beach there will be a regular camp, with sleeping, cooking and dining tents, and a complete camping outfit. It will stand in a grove, looking out over the sea, and with a spring of excellent water near at hand. This camp will be resorted to as the weather permits, and the boys will here be initiated into many of the fascinating secrets of real camp life.

For further enjoyment there is always plenty of good fishing to be had, and at a fine little beach near the camp daily lessons will be given in swimming and rowing.

Frequent trips will be made to the various collecting grounds, and practical instruction will be given in the best methods of collecting, preserving and arranging specimens. This will include Taxidermy if so desired.

Some of the simpler truths in Natural History which the collected specimens illustrate, and in which they awaken an interest, will then be talked over and explained.

The formation of a healthy, vigorous interest will be the constant aim—an interest that will develop into a genuine pleasure in unraveling Nature and applying her truths to everyday life.

Two good microscopes will be furnished for the use of the boys, with the necessary apparatus, and they will be taught how to use them properly. A reference library of some fifty volumes, containing the best recent publications in Natural History for boys, will also be furnished.

The Camp will open on Wednesday, June 26th, and close Friday, August 23d.

Terms—for the season, $65; for one month, $35. [This will include laundry and all ordinary supplies.] For any further particulars address

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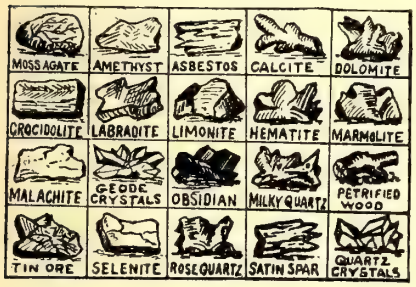

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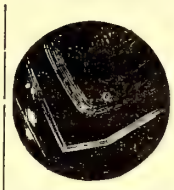

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Bohemian Waxwings, a beautiful lot.
Black Ground Hog, rare.
Black Squirrel, a very few fine skins.
Egyptian Fruit Bat, very large.
Pocket Gophers, several species.
Western Fox Squirrels, something nice.
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Bonaparte's Gull	50	Green Heron	20	Tree Sparrow	10
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Gadwall Duck	45	Killdeer	15	White-breasted Nuthatch	10
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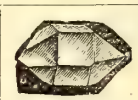

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PRICE LIST FURNISHED FOR STAMP.
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NATURAL SCIENCE NEWS

VOL. I. No. 15. ALBION, N. Y., MAY 11, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO EXCHANGE.—Small vials of colored pebbles from 10 to 25 cts, very pretty. A few Magpie eggs. Also some novels, list sent on application. MARY HERHOLD, Box 92, Sheridan, Montana.

WAR RELICS, Indian Relics, Corals, Coins, Confederate Money, Papers with reward notices for runaway slaves, Marine Specimens, Fossils for cloth Bound Books. EUGENE SHUGART, Box 71, Harpers Ferry, W. Va.

NOTICE.—The art of Embalming Birds, etc. —flesh and bones entact—taught by mail and formula furnished. DR. F. A. TRAVER, Racine, Wis.

AMATEURS, I would like to exchange common sets ofeggsfor common sets of other states. Especially want Water,Sea birds,Birds of Prey and any of the *Fringillidae* family. Correspondence solicited. All letters answered. Send lists. RALPH W. CLAYTON, Box 454, Galesburg, Ills.

FOR EXCHANGE.—From 1891 to date of Great Divide to exchange for $5.00 worth good fossils. Send list. Fine Pyrites 10 cts each, 3 for 25 cts. Choice minerals and fossils. H. B. DERR, 6561 Michigan Ave., Chicago, Ill.

ONE note-head size simple printer or duplicating apparatus to exchange for mounted birds. curios or offers. Indian relics for sale cheap. A. D. GRUTZMACHER, Mukwongo, Wis.

FOR SALE.—Sea Shells, Corals, Sea Beans, etc. A cabinet collection of 20 different kinds, ½ to 2 inches, a part of them scientifically named. All sent postpaid for only 20 cts. Sawfish saw 6½in, 20 cts. H. T. ALLEN, Seven Oaks, Fla.

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I WILL exchange a No. 2 Caligraph Typewriter, books on camping, hunting, fishing, trapping, birds; marine curios, for gun, rifle, fishing rod, loading tools, fishing tackle of any kind, reel or books. Letters expecting a reply must enclose a stamp. A. D. AKIN, Box 28, Key West, Florida.

WANTED.—The Magic City Portfolios published by the Historical Publishing Co. Will give full exchange in minerals, fossils, Indian relics or eggs. GEO. W. DIXON, Watertown, S. D.

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FOR SALE for cash, reduced rates, a lot of *fine* new books for Naturalists; also a 1st class lot of foreign stamps and $3.00 Scott's album. Write *quick* with *stamp*. GEO. W. VOSBURG, Box 307, Columbus, Wis.

WANTED. Small collecting gun in good condition, for well mounted birds or part cash. Give particulars in first letter. ALEX STRACHAN, Rockford, Ill. 15-2t

TO EXCHANGE.—Coues' Key for Goss's "Birds of Kansas." Also a pair of climbers and a young Jack Rabbit for sale. FRED MALTBY, Olathe, Kansas.

NOTICE.—5 oz specimen of Arkansas Blue Granite with data sent prepaid for 10c. CHAS. H. FINNE, Box 280, Little Rock, Arkansas.

TO EXCHANGE for minerals or Indian relics about 500 foreign stamps, all different,some rare. CHAS. G. NASH, 41 Grand St., Woonsocket, R. I.

BARGAINS in sets and singles of Oregon eggs. Enclose stamp when writing. ARTHUR L. POPE. Sheridan, Oregon.

FOR SALE or EXCHANGE.—Minerals, Fossils, Shells, Curiosities, etc. 20 varieties of Minerals, Fossils, Shells, Curios, etc., postpaid 25c. G. H. BRIGGS, Livermore, Maine.

HOW TO write on iron and glass indelibly, both receipes for a fine U. S. copper cent any date prior to 1845. ARTHUR B. ROBERTS, Weymouth, Medina Co., Ohio.

ATTENTION! Look! Send me 15c and receive by return mail a first-class set of 4 or 5 eggs with data. Send for egg lists. HARRY GRIFFITH, Santa Ana, Orange Co., Calif.O&N

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WANTED.—Smith & Wesson revolver, 32 double action. Must be in good condition will give sets, singles and part cash. BRYAN M. GRANT, Tallahassee. Fla.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or 'finds.,"EDWIN E. HOWELL, 612, 17th St. N.W.,Washington,D.C.

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STEAM ENGINE.—I have a patron who wants a good small second-hand engine and boiler of from 2 to 4 horse power. If you have one in good condition that you will swap for eggs, skins, shells, specimens or curios of any kind, write FRANK H. LATTIN, Albion, N. Y. tf

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$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

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FLORIDA COLLECTORS.—The Ebersold family, composed of ten persons, devote nearly their whole time to the collection and preservation of Sea Shells, Bird Skins and Eggs, Fishes, Snakes, Alligator Skins and Teeth, Florida Curios and all Natural Science objects to be found on the east coast of Florida. We have on hand a large collection of shells and east coast photographs, any of which we will sell or exchange for desirable Natural Science books or collections from other localities. Address, enclosing stamp. D. S. EBERSOLD, Oceanus, Brevard Co., Fla. tf

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

FOR SALE.—Thirty nice minerals, first offer gets them for 45 cents. JOHN M. ABBOTT, Westford, Mass. 14-2t

SALE or EXCHANGE.—Beautiful Golden Shells for ornamenting purposes. 25 to 75c per hundred. Many other kinds of sea shells. DR. AYER, Madison, Conn. 14-2t

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TO EXCHANGE.—Three very fine Scotch collie pups. Two males, one female; for books on Geology, or Fossils. Will sell for cash at $3.00 apiece. A. L. HYZER, Andes, New York. 14-2t.

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To Dealers and Collectors: Will furnish small Fossils, Shark's Teeth and Corkscrew Fossils from Stafford Co., Va., for $1.50 per 100. The fossils are something new and unique. GEORGE W. KIRTLEY, Fredericksburg, Va. Ao-10n-e3mo.

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Rochester.....	5:55		8:00	10:30	2:20	5:35	10:00
Albion	6:50	7:00	9:00	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:00	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
Albion.....	7:05	8:20		1:00	3:25	6:45	7:55
Rochester.....	8:05	9:30		2:05	4:40		9:00

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Spermophiles—Leopard, Pallid, Franklin's, &c.
Wood Rats, Cotton Rats, Roof Rats, Musk Rats.
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E. H. HARN, HENRY, N. C.

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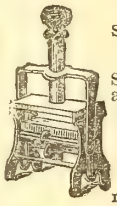
Respectfully yours,
MORRIS GIBBS, M. D.,
Kalamazoo, Mich.



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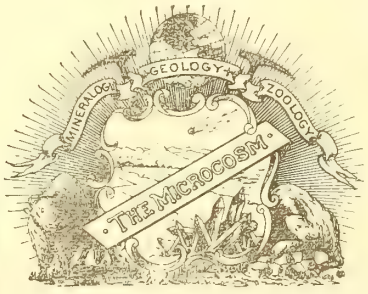

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ESPECIAL ATTENTION is given to the selection of material for students and investigators in crystallography, microscopy, &c., &c.

Recent Additions to Stock.

QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

Send for our complete list of new arrivals.

Price Lists and Circulars Free.

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"Catalogue of Minerals,"

fully illustrated, 128 pages, 10c; bound, 20c.

FROM THE "COPPER QUEEN" mine in Arizona, we have just obtained the most beautiful, gem-like crystals of AZURITE, which with tufts of velvet MALACHITE are scattered over stalactites of Wad and Limonite. The crystals exhibit a new habit and their arrangement over the Limonite surface is most novel and striking.

Also, *Cuprites* in large octahedrons: delicate blue *Chrysocolla; Stalactites* with an exquisite tinting of pale sea-green color.

Most of the above can be furnished in cabinet specimens at 25 cents and upwards, the price being determined by quality and rarity.

Always mention NATURAL SCIENCE NEWS *when answering this ad.*

Natural Science News.

VOL. I ALBION, N. Y., MAY 11, 1895. No. 15

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

Entered at Albion P. O. as 2nd class mail matter

In response to our notice in NATURAL SCIENCE NEWS of Feb. 9th we received thirty-nine (39) designs for a heading to the NEWS. Making a selection from this number was no small task and led to the rejection of a number which were perhaps fully as meritorious as the one chosen. The accepted heading was designed by Mr. W. P. Davison, of Lockport, N. Y., who will receive the $5.00 prize offered.

The following parties sent designs well deserving the prize, but owing to the fact that only one could be awarded, their designs were necessarily returned:

R. B. Farley, Trenton, N. J.

H. V. Flickinger, Bucyrus, O.

Chester A. Reed, Worcester, Mass.

Jas. McCraken, Cedar Rapids, Iowa.

Geo. W. Vosburg, Columbus, Wis.

Fred E. Pomeroy, Lewiston, Me.

A GROUP OF COLORED CRYSTALS. —Take half an ounce each of alumine (alum,) sulphates of copper (blue vitriol,) of iron (green vitriol), magnesia (Epsom salts,) potash, soda and zinc (white vitriol,) separately dissolve them, and pour all the solutions into a large vessel. When the water evaporates, the crystals will shoot up, and the intermixture of colors will present a beautiful sight.—*The National Educator.*

Ophidians in Captivity.

Aristotle said that snakes were confirmed epicures, lived like sybarites and were extremely fond of wine, of which they were excellent judges. Virgil (Aeneid, book 2, line 471), speaks of the snake "made venomous by feeding upon poisonous plants." Pliny imagined that their favorite food was milk. Since the day of these grand old classic prevaricators the snake has been made the subject of exhaustive study by anatomists, systematists, and by the chemists who have investigated the properties of the poison of the venomous species, but comparatively little progress has been made in the study of reptilian tastes and characteristics. As O'Reilly aptly observes "regarding the habits of snakes, we are still at the mercy of Aristotle and Pliny."

Would-be naturalists usually offer their captive snakes bread and butter, just as the child did in the story quoted by Dr. Holmes. Snakes destitute of ears, and consequently "deaf as adders" incapable of hearing ordinary sounds conveyed through the air, are still represented as being "moved by a concourse of sweet sounds," and literally dancing to music. Few people doubt the snakes appetite for milk, and the belief that they will suck the milk from cows, or from the breast of a sleeping woman is an orthodox part of most peoples' religion. Even Prof. E. D. Cope, as I notice with profound regret, says that his daughter, when a girl of from six to eight years, kept a number of king snakes, *Ophibolus getulus*, as pets, and they drank milk readily from a cup which she held in her hand. (See "A Critical Review of the Characters and Variations of the Snakes of North America,")

Snakes subsist on fishes, batrachians, reptiles, worms, insects, birds and small mammals which they swallow whole. It sometimes happens that a serpent will devour dead and mutilated animals, but as a rule they must capture their prey themselves. Venomous snakes usually, but not always, bite their victims and let them die before swallowing them, and other snakes sometimes crush their prey in their coils before eating it, yet it is the general habit of our common snakes to swallow their victims alive.

Some works on Natural History state that snakes do not drink water, but this is now well known to be a mistake. Some of them drink in full draughts, others lap up the water, usually dew drops, with their tongues.

Certain snakes take food readily in captivity.

For example I have seen young garter snakes, *Eutænia sirtalis*, eat earth worms almost immediately after capture. Others obstinately refuse to eat and can only be induced to do so by giving them a certain degree of liberty, and making their surroundings resemble those to which they are accustomed in a state of nature. Dr. Weir Mitchell often kept from 10 to 35 rattlesnakes at one time and found them unwilling to eat during the first year of their captivity. He fed them by putting a long funnel in their mouth and forcing the food through it into their stomach. Some German naturalists unable to induce imprisoned "Cross Adders," *Vipera berus, L.*, to eat tried feeding them in this way, but the obstinate ophidians presistently disgorged the unwelcome food and perished in a few months. G. Bleyer-Heyden, however, kept serpents of this same species in a large, well appointed terrarium and found that they would not only eat but would even propagate.

Most of the tropical snakes which we see in travelling "Museums" has suffered so much from ill treatment and close confinement that they will not eat and cannot discard and renew their outer skins. The gaping spectators at such "shows" are looking at miserable, semi-torpid creatures.

With anything like decent treatment most of our harmless Colubrid snakes will eat in captivity, though there is as great diversity of dispositions, tastes and appetites among them as among higher animals. The beautiful little green snakes which well deserve the protection of every humane man, eat worms and insects all their lives, both *Cyclophis vernalis* and *Phyllophilophis aestivus* being so gentle that they will submit readily to captivity. The *Eutænia sertalis* on the other hand soon outgrows its taste for the earth-worm diet of its infancy and demands toads and frogs, though it will still eat earthworms in time of need and will also

eat minnows. Other observers have fed their *Eutæniae* mice and sparrows, but I could never induce one of mine to eat either a mouse or a bird. Another snake that sometimes eats mice is the *Ophibolus getulus*, though my captives of this species would eat nothing but snakes. Almost all water snakes, *Natrix sipedon* will take food readily in captivity, though they are fierce and bold and do not yield to good treatment, now and then, however, I find one that obstinately refuses to eat and which must be liberated to keep it from perishing. All the members of the Heterodon family will usually take food but now and then you will find an individual that refuses to do so and will starve rather than submit to captivity.

No matter what kind of snakes I have, I always keep them supplied with milk and eggs hoping against hope that some day I will find a serpent who will act like those in books. Thus far I have been doomed to disappointment, for I have never yet seen a snake eat either milk or eggs. Snakes tastes are varied, as I remarked before and I do not mean to say such a thing would be impossible, but I do say emphatically that I have not seen it myself.

Angus Gaines,
Vincennes, Indiana.

Sea Beans.

We would like to ask any of your readers who have been in Florida whether the so-called "sea beans" employed in jewelry grow there? We have brought them from Cuba where they are "at home" and have heard that the common name was given from their being found at sea. They might easily drift to the main coast but have they found the soil and climate suited to their development in Florida?

The yellow bean "*Bromis spinosus*" is commonly known in Cuba by its Mexico-Indian name Guacalote; its old aboriginal name was Guanana. The boys of the *Veultarriba* (*veutta de arriba*), or eastern part of the island use these yellow guacalotes as a kind of money, playing their cards and various games of chance for them, and even passing them as money for some articles. The roundness and smoothness of the smaller yellow ones cause them to be much employed in games simliar to our marbles, which they call "horyitos" or little holes, "unate," and "pila." In one game of "pila" four of these beans are used, three being placed together and the fourth piled above them; in another they strive to overturn a "little house" and call the game from this "casilla" from what they build up of the beans. The small, perfectly rounded ones are known as "teritoes" or "mingoes," while a large, flat, variety is called "catatas." Among the yellow-ones a gray bean is often mixed which is the *Guilandina bonduc* scientifically.

As the boys of the eastern end of the island favor the guacalote, what is more natural than the hostility shown by the boys of the western end? So in the *Vueltabajo* (*vuelta de abajo*) where the fine cigars come from, the red beans are employed and the yellow ones scorned. The red ones are commonly called mates, and we have been unable to find its scientific name in a very minute work on Cuban natural history. Was the author a Vueltarriban boy?

The boys of Bayame name the last bean left in playing their games the gaubino.—H. M. K. B.—*Random Notes.*

Cultivating Sponges.

Sponge farming has been found to be a very profitable industry, and at present there are hundreds of acres in the Gulf of Mexico, along the Florida coast, devoted to this novel purpose. The attempt to grow sponges was first made when it was discovered that the sponge fisheries of the Bahamas and the gulf coast of Florida showed signs of becoming exhausted. It has since been found that under proper cultivation sponges may be raised which are superior in quality and command higher prices than those found at sea. The site for a sponge farm is usually some arm of the sea where the salt water flows in freely. The only preparation necessary is to drop in rocks, stones, and other substances for the sponges to fasten themselves to and dam up the lagoon so that the sponge seeds cannot be blown out to sea. The farms at first obtained their supplies of sponge seeds from the Fish Commissioners, but latterly they obtain them directly from the sponge fisheries. In the autumn of the year the various varieties of sponges are purchased by the sponge farmer, care being taken to secure both the male and female cells. The sponge seeds are generally kept in small "pounds" during the winter months, and here the masses of protoplasm develop and grow. The spores are liberated early in the spring. They swim about, the eggs grow rapidly and soon attach themselves to the rocks or coral at the bottom of the water. The sponge farm requires little attention after it is once started. The sponges grow slowly, and, as a rule, none are pulled up till the end of the third year. The largest sponges are then gathered and the smaller ones are left to produce new seeds and grow to a larger size. The sponges may be readily gathered on sponge farms, since the water is usually shallow and smooth, and the dangers of ordinary deep sea sponge fishing are not encountered. The finest sponges raised in this way are said to sell for from $1.50 to $3.00 per pound. If no diseases or enemies get into the sponge beds, the sponges yield large crops year after year. The yearly income from the sponge farm is said to range from $1,000 to $10,000 according to its size, location, and age.—*Sci. Am.*

What Has Become of the Bluebirds?

"What," indeed, "has become of the Bluebirds?"

They are more than late in this locality for on this 5th day of May not one has been seen here as yet.

B. S. Bowdish,
Phelps, N. Y.

Bluebirds are usually abundant here. This year the first was seen April 6 but although I have spent from one to five hours a day in the field this spring, I have not seen to exceed four Bluebirds.

H. C. Higgins,
Cincinnatus, N. Y.

Mr. E. B. Webster of Cresco, Iowa reports an entire absence of Bluebirds this spring—and says:—An abundant migrant, arriving in advance of the robins, and a common summer resident, as a usual thing, but this year the Robins are nesting, and no Bluebirds. Were they all frozen?

This spring the birds as a rule are much later than usual in arriving from the south, although I have seen two or three species on earlier dates than I first saw them last year. Although nearly all the birds which, up to date might be expected, have arrived, yet in num-

bers they are few, much fewer I think than in former years. Bluebirds, especially are very scarce and thus far I have seen, I believe, but two of these birds. These were seen on April 18th. On April 7th I heard the calls of two or three as they passed over, going north, but remember of hearing them at no other time.

A. Houghton,
Potsdam, N. Y.

Last year and the previous years, the Bluebird was very common, even as much so as the Robin, and usually was here in great numbers by the 25th of February.

This year I have seen but one Bluebird, on March 27th.

The Robins also are very scarce indeed, last year they were here commonly, and were incubating at this date, but I have not seen over 10 Robins, and as yet no traces of nest building. Regarding the other migrants they are on an average three weeks behind time, and the Red-headed Woodpecker 25 days later, than last year.

Let us hear more on this subject from other localities, especially South, for where can the Bluebirds have gone to unless, as suggested by Mr. Nowell.

Walton Mitchell,
St. Paul, Minn.

Not a Bluebird have I seen this year though every Sunday this spring I have gone from 5 to 15 miles watching the birds and often during the week days, I have been out for a few hours at a time in the favorite haunts of the Bluebird.

The Robins are much less abundant than formerly.

All the other birds seem about as plentiful as usual, so far as I have noticed.

May the gun "hang fire" that is directed toward *Sialia sialis* this year at least.

Virginius H. Chase,
Wady Petra, Ills.

There is a universal absence of the sweetest of our spring songters, the Bluebird. From all the country comes the perplexing question: "Where are the Bluebirds?" Since the unusual winter I have seen only two. But where are they? I believe as nearly everyone else that they were frozen. Several instances have come to my notice: recently I noticed an old Titmouse nest and determined to explore it. On pulling away the bark, I saw a dead Bluebird. This had doubtless tried to escape the cold by entering the hollow. One farmer says that he has found six dead Bluebirds in one hollow, shortly after the freeze.

Previous to this season I knew of more than twenty favorite nesting places of the Bluebird which were occupied annually. I go there now but they are vacant,—no birds are seen.

Clarence L. McCartha,
Troy, Ala.

I find that the Bluebird which has always been our most common bird is missing. I have only heard of one pair being seen anywhere within ten miles of here they may come yet but they are fully six weeks behind time now. If you have any information that you can give as regards them you would oblige me greatly by letting me know either through your paper or otherwise.

Robert Smith,
Mill Grove, Ont.

I was very much interested in the article in Natural Science News of April 27th, concerning the late arrival and scarcity of the Bluebirds. Up to date I have only heard one Bluebird. April 27th I attended a lecture in Springfield, Mass., given by Mr. Colburn late principal of the High School, who is a good authority on Mass. birds, especially those found in the vicinity of Springfield. In the course of his remarks on the birds found near his home, he stated that he had just received a letter from a friend stating that during the cold snap in Florida last winter, that hundreds of Bluebirds we found dead on the ground, having been killed by the cold weather prevailing in the South. This probably is the cause of the scarcity of the beautiful "harbinger of spring." All lovers of birds, will do well to protect every nest of this species. We haven't seen as many birds of any kind this spring as usual, in our rambles in the fields and woods. We saw our first Swallows May 2nd. The Natural Science News is a welcome visitor to our home and we wish it success.

Erwin G. Ward,
Palmer, Mass.

Bluebirds, from being one of our most common summer residents has changed to a very rare species. Formerly they were one of our most numerous breeders, and now I have failed to hear of a single pair nesting in this section. Thus far I have only seen four specimens.

H. J. Giddings,
Sabula, Iowa.

The first real spring migrant we have, the Bluebird seems to proclaim to us the coming of spring. Always looked for on Feb. 22 and seldom failing to put in an appearance by that date or even earlier, we have looked for him this year until we almost despaired of seeing him. All the favorite swamps and hillsides were searched in vain and it was not until March 19 that a pair made its appearance. They seemed to be the last of their race for it was not until April 11 that the next ones were seen, a small flock of six or seven flying overhead. Since then we have hunted for them in vain. The usual haunts where they have been so abundant for years seem deserted now and the orchards where they were building their nests at this time last year do not contain a single pair.

I am afraid it is only too true as stated by Mr. J. Rowland Nowell in the Natural Science News of April 6 that numbers of certain species of birds have perished from the cold or lack of food and that they are returning to us in greatly reduced numbers. Let us hope that it is not as bad as we now fear and that the Bluebirds and others so dear to us will continue to multiply and increase for many years to come.

Foster H. Brackett,
Boston, Mass.

During the first part of the winter in the months November and December, the Bluebirds were extremely common. Found commonly in small flocks of six or more. Since the heavy snows that followed in Jan., Feb., and March, I have recorded but 13 live Bluebirds. On several occasions since the last snow I have found dead Bluebirds.

On April 20th while out collecting I found four dead males in an excavation in a fence post. My notes show 22 frozen Bluebirds since the last snow storm, among which are 13 males and the rest females. I know of only two pairs at present. Both pairs have nests and it is safe to say that they will rear their broods in peace.

The Bluebird is an abundant resident in this part of the state.

But this spring I have seen very little of *Sialia sialia.*

W. S. Colvin,
Osawatomie, Kans.

I can heartily agree with my Brother Ornithologists in regard to the late arrivals of our Spring birds, and also, the great scarcity of the Bluebird, which seems to be less abundant at present, than it was when it first made its appearance in this locality. The Bobolink seems to be on time. I first heard his jingling notes on April 30. But where are the snakes? I have not seen one this spring up to the present date, May 1, nor have I heard of any one who has.

Did they freeze so hard that they could never resurrect: or has the *ghost of St. Patrick* visited our American Continent?

I am longing to again be scared by a snake, on some of my rambles, it would seem so natural.

James B. Purdy,
Plymouth, Mich.

We nave always called the Bluebird common in this county until this year. But although I have looked for it since March 1st, I have not seen one, and I have been in the woods from 2 to 4 days every week; and over a large track of land.

Three have been reported as seen this spring, one, a male, on March 5th and a pair was seen on April 29.

Robins were never more abundant and Am. Goldfinches, Sparrows, Swallows, Swifts, Martins, Killdeers, Flickers, Brown Thrashers, and Blackbirds are here in goodly numbers, but late in arriving.

Wm. F. Shaw,
Ithaca, Mich.

Seeing the comments in Natural Science News of April 27 about Bluebirds. I would say, it seems queer to me how few in number they were last year and this year—yet last fall I saw many of them while in the woods, but yet do not hear them near houses as I used to when a boy—and my boys' little bird houses fail to be occupied by them while when I was a boy—every old cigar box, etc.,—yes dry summer squash shells I could find were fixed and hung up and the Bluebirds occupied them all, and more would have been if I had had more houses.

Does the Sparrow (English) drive them back to the hollow trees in the woods, where they nest, if not why so many in the fall? First one I saw this year was April 10.

A. D. Ayer, M. D.
Madison, Conn.

He is usually the very first of our feathered friends to arrive; even before the Robin had been noticed his rich, soft notes used to be heard from the tops of the tall poplar or his bright blue mantle be seen gliding through the orchard to visit his last year's nest, and in former seasons they were by this time mated and busy preparing their summer residences.

This season they are absent. I have heard of one or two isolated individuals being seen about the end of March; but I have not seen one, and do not know of a single pair being located near Hamilton, where tney used to be so generally distributed.

As it would be quite interesting to know how far their change of habit extends, and what has led to it, I hope some of your readers may be able to throw some light on the subject.

For the past few years there is no doubt tbat the English Sparrow, by appropriating their boxes, have driven them from about our houses; still, they have been common throughout the country until this spring, when they have failed to appear.

T. McIlwraith,
Hamilton, Ont., May 1, 1895.

"What has become of the Bluebird" is an interesting question to all bird lovers. Ten to fifteen years ago they were among the first spring arrivals, and year after year 5 or 6 pairs nested in our back yard in boxes set upon poles and in the smoke house and woodshed, and they were never disturbed by the egg crank, or the small boy, but raised their brood in peace and departed to warmer climes. But a greater enemy has come in the shape of the English Sparrow. At first it was a tug-of-war, and the Bluebirds fought bravely for their homes, but with all the help we could give them with the shot gun they had to give up the battle. Last year one pair came and nested in a hole in an apple tree, but the Blue Jays picked them out one by one as soon as they were hatched. This spring I have not seen a Bluebird, and this is the first of May.

Irene L. Cass,
Maumee, Ohio.

Spring Messengers.

Old Winter with his chilly breath,
His cold white robes of snow,
Has passed away and in their place
The grass and flowers grow.
Though once the earth was clad in white,
'Tis now in green arrayed,—
Its lovely dress by the deft hands
Of Mother Nature made.

The cowslip and the daisy,
Are peeping from the ground:
The violets are blooming,
In beauty all around;
The vines are climbing upward,
Toward the smiling sun,—
All Nature is rejoicing,
That Winter's race is run.

The birds are merrily twittering
In orchard, field and grove,—
The Bluebird and the Robin,
The Linnet and the Dove,
The Meadowlark and Brown Thrush.
The Sparrow and the Wren,—
All the glad messengers of Spring—
We welcome them again.

Geo. J. Remsburg.

Intestinal Obstruction in "Somateria dresseri.

Saturday, April 22nd, I obtained a fine specimen of American Eider, female, and upon examination found that in the abdomen was a large "lump," over which the feathers were rumpled and displaced and in places missing, leaving the abdomen bare. A little curious I opened the abdomen during the skinning process (and in fact couldn't help it for the intestines were so firmly adherent to the abdominal walls) and to my surprise found a solid lump of "mussel" shells measuring, two and one-half inches in diameter and weighing three quarters of a pound. The shells were held together by a gelatinous substance which had hardened; and the whole mass was stained with bile. The outer coats of the intestines were firmly adherent to the abdominal walls as a result of inflamation and although perforation of the intestine had not taken place, it undoubtedly would have done so shortly. The mass was situated about two inches from the pyloric orifice of the stomach, and judging from the extensive adhesions formed, must have been situated at the same place for at least two weeks. The bird otherwise seemed to be in perfect health and judging from the fact that at the time of shooting, it was flying as well as any of the rest of the flock; we may safely assume that the vitality of this species is something remarkable.

C. C. Purdum, M. D.
Woods Holl, Mass.

PUBLISHER'S DEPARTMENT.

The Hoyt-Ward Cyclopedia of Practical Quotations.

We have recently received from the publishers, Funk & Wagnalls Co., 30 Lafayette Place, New York, a copy of this Cylopedia of Quotations, and find it to be, as stated by the Boston Globe:—

One of the most valuable books of the time. There are over 17,000 quotations, including many not included in previous compilations, and unusual care has been shown in making them strictly accurate, as well as in giving the authorship, where that was ascertainable. An admirable system of classification has been adopted, there being nearly a thousand subject heads; and by the full concordance, which forms such a valuable feature of this book, every one of these quotations is made readily available. The subdivisions of the Cyclopedia will commend themselves to every reader. Special mention seems to be called for regarding such characteristic features of this book as the collection of nearly 2,000 quotations from the Latin, the list of proverbs and familiar sayings in French, German, Italian, and other modern languages; the department of Latin law terms, which is particularly valuable; and a biographical dictionary of the names of the 1,200 authors quoted in this work.

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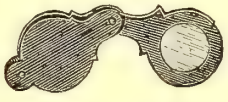

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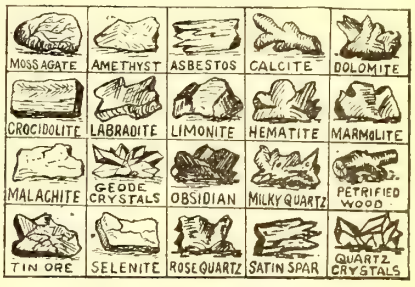

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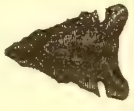

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NATURAL SCIENCE NEWS

VOL. I. No. 16. ALBION, N. Y., MAY 18, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO EXCHANGE.—A complete set (13 volumes) of Pacific Rail Road Reports, for camera or type-writer. Write stating particulars. All letters answered. SHELLEY W. DENTON, Wellesley. Mass. 16-2t

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FOR SALE.—A No. 2 Kodak in good order for cash or part cash and part in instruments. Make offer. All letters answered. A. GORDON LEAVITT, St. John, N. B. 16-2t.

NOTICE.—I would like to get 2 or 3 good books on Natural History or any branch. Can give in exchange common eggs, shells, curios, etc. from this locality. W. H. HILLER, 147 W. 23d St., Los Angeles, Calif.

EXCHANGE.—Sets and singles of this locality to exchange for sets of other localities. Eggs of water birds and birds of prey especially desired. GEO. S. GREENE, 1447 Temple St., Los Angeles, Cal.

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I WANT double barrel shotgun, instaneous camera, books on electricity and conchology, electrical apparatus, museum specimens; will give in exchange rare bird skins (White and Brown Pelicans, etc.) rare stamps and marine curios. M. A. DAVEY, Galveston, Tex.

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BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Addresses of collectors of Relics. Indian Relics, Coins, Stamps, etc. State what you need in this line All letters answered. A. CLIFTON SHEPLEY, Canton, Ill. 16-2t

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TO EXCHANGE.—Collection of 30 World's Columbian Exposition tickets for best offer in eggs, common bird skins, shells, fossils, minerals. Indian relics and curiosities. Address E. T. LANGWORTHY, 413 W. St., Englewood, Chicago, Ill.

WANTED.—Eggs in sets and singles with data. Have to exchange same and minerals, fossils, Indian relics and polished agates. Send full list. GEO. W. DIXON, Watertown, S.D. O

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AN OOLOGISTS' EDITION. The *Nidiologist* for May is brim full of good "pointers" for collectors, as "Apparatus" with 3 illustrations by Fred M. Dille: "Ideas for Campers and Cruisers" (illus.); "Hints to Egg Collectors" by Scolopax; "Dr. Murchison's Egg Drill"; "More Hints" by J. H. Bowles; "A Device for Egg Blowing" (illus.)—these are some of the valuable features. "The Western Collector" (portrait) and "Glossy Ibis at Heron Lake" (illus.) by P. B. Peabody are other attractions. "The '*Nid.*' is indispensable to live Ornithologists and Oologists." Subscription price $1.50 per year; sample 10c; May number singly 15c. We make you this desirable proposition: 4 months' trial subscription *besides* May number and November number, with beautiful colored plates *free*, for only 50 cents. Remit soon. H. R. TAYLOR, Publisher, 150 Fifth Ave., New York City.

WANTED. Small collecting gun in good condition, for well mounted birds or part cash. Give particulars in first letter. ALEX STRACHAN, Rockford, Ill. 15-2t

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Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		8:50	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:35		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:10	1:40		5:50
Susp. Bridge .		6:45	8:10	11:20	1:48		5:55
Lockport.....		7:30	8:50	12:00	2:25	5:55	6:35
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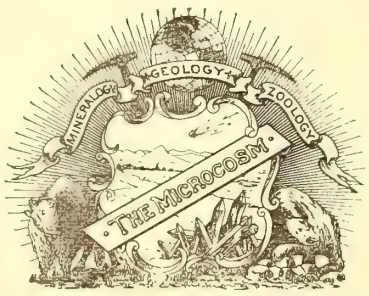

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QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

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Most of the above can be furnished in cabinet specimens at 25 cents and upwards, the price being determined by quality and rarity.

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Natural Science News.

VOL. I ALBION, N. Y., MAY 18, 1895. No. 16

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Entered at Albion P. O. as 2nd class mail matter

Should you happen to receive an extra or "sample copy" of NATURAL SCIENCE NEWS, please hand or forward to some interested friend.

Our new half-tone heading is not a success. An engraving will, however, be made of the same in a few weeks which we trust will be equal to the original design and to our satisfaction.

Forestry at the Southern Exhibition.

It is promised that the exhibit of the timber and timber trees of the North will be very complete at the Atlanta Exhibition.

The forest resources will be shown, aside from maps and charts, and other graphic illustrations, as to their amonnt and distribution, by a series of twenty monographic displays, showing each one of the economically important tree species which form the bulk of the timber production of the South. Here will be seen, in monster frames made of the trees themselves, a full description of the tree, in its foliage and fruit, its timber, its range of distribution, and all information desirable regarding the nature of the wood and its application in the arts.

To further illustrate the forest botany of the Southern States, sections of wood, with botanical specimens, and descriptive labels of more than 100 different kinds of Southern trees, will be displayed, not counting some 100 Florida and Texas species, which are of a semi-tropical character, so that the student of the flora of the South will find a rare chance for getting acquainted with its different arborescent features.

One of the main features of the exhibit will be the timber-test work, which the Division has carried on during the last three years. It is expected that a testing machine will be kept in operation, so that the manner of carrying on the work can be practically demonstrated. As most of the testing has been hitherto performed on Southern timbers, especially the Southern pines, the display of broken material, with the weights which broke it recorded, all combined into an artistic structure, will be both instructive to Southern men, who furnish, and to Northern men who mostly use this timber.

CHEMICAL FERN FRONDS.—A neat experiment to please the young may be performed in the following way: Saturate some strips of thin cartridge paper with an alcoholic solution of gum benzoin, and, when dry, apply an aqueous solution of bichromate of ammonia. Crimp or fold these slips backward and forward so that when opened out they will stand upright in a zig-zag form. Place one of these slips upon a plate and ignite it in two or three places along the upper edge, but without allowing it to blaze. It will burn slowly down with a red glow, diffusing an agreeable perfume, while the ash of the paper will assume the most fantastic arborescent shapes, together with a green color which, to a lively imagination, may be suggestive of the growth of ferns or lichens,—*Sci. Am.*

Field Columbian Museum Accommodates a World's Fair Crowd.

Field Columbians Museum had a spring opening yesterday and more than 5,000 visitors passed through the turnstiles. From 10 o'clock in the morning there was a World's Fair flow of humanity toward the big white building, and at 3 o'clock in the afternoon, when the crowd was largest, there was over 3,000 persons in the galleries.

The crowd was a reminder of the World's Fair as much as the contents of the museum. People were there from all parts of the country and they were of all ages and conditions. The mechauic, the smiling maiden, the man who carried a silk hat, the girl in bloomers with her bicycle at the door strolled among the statuary and relics.

The skeleton megatherium and the reconstructed mammoth held a levee, for the crowd lingered longest in the department wherein their bones are preserved.

The small boy was ubiquitous, but was most noisy in the Chinese anthropological room. Here he held animated discussions about the shortness of John Chinaman's foot and the length of his cue.

When the young women entered the Indian room they lingered and lingered. They were not studying dead Indians, but gazing on a live one—the handsome Antonio Apach, an attache of the Indian department.

The crowd of women around the cases of jewels looked like that around a bargain counter. "Isn't that perfectly lovely?" was repeated over and over. Similiar crowds stood before the tapestries in the texile room, and some of the women, true to the shopping instinct, could not resist running their hands over a white Irish linen tablecloth, although on its frame was the sign in big letters, "Please do not touch." The guards in this room was kept busy telling the girls who gave the spinning wheels a turn that they were for instruction and not amusement.

The transportation department looked as if an excursion had just arrived there. It was crowded with men talking about the speed of the engines and the strength of the boats.

Director F. J. V. Skiff was seen circulating through the crowd, smiling over the large attendance. Among the visitors in the afternoon were Congressman Boutelle of Maine and Mrs. Hannibal Hamlin, the widow of one of ths United States vice-presidents.

When the visitors began to go out of the doors at 4 o'clock, the time for closing, it looked like the outflow from the World's Fair gates in the evening time.—*Chicago Record, April 29th.*

Bird Arrivals; Season and Migration.

I have been much interested in the notes given in recent numbers of the NATURAL SCIENCE NEWS touching the irregular arrivals of our birds and the missing Bluebirds.

However others may have found it in their localities, I cannot use my list of arrivals for 1894 as an average by any means.

It was an unusually precocious spring—that is in its earlier part. I slept in an old ruin of a stave mill on the night of March 21 while on a duck hunt, the weather being as comfortable as in summer. I remember scribling on a beam in the loft these words: "My brother Lawrence and myself spent the night of March 21, 1894, in this loft; retired at 11 o'clock, called at dawn by porter Pewee." —signed.

So in the table below I have used the arrivals for 1893 instead of those of 1894, whereby I think we get a truer comparison.

It is a singular and interesting fact that Robins, Meadowlarks and Flickers turned up here and there and now and then all through the very severe winter just past. A single Song Sparrow was my especial protege, though very shy, and fed upon the crumbs which I scattered about the door. Singularly this little fellow invariably disappeared with every big drop of the thermometer, and returned only with milder weather. Where he went is a mystery; surely he could have found no place where he would be more certain of food. But this is a puzzling way which all the birds have which erratically reside with us all winter, On mild or balmy days they are all activity and you are sure to find them—a sudden drop—and they are gone, not to be found with diligent search.

My notes show the following comparisons:

	1893.	1895.
Bluebird	March 7	April 7*
Flicker	March 7	resident
Robin	March 8	resident
Killdeer	March 9	March 23
R'd-w'g'd Bl'k-b'd	March 9	March 27
Bronzed Grackle	March 11	March 1
Meadowlark	March 13	resident
Phœbe	March 20	April 8
Brown Thrush	April 4	April 21
Wood Thrush	March 31	April 20
Yellow Warbler	April 26	April 25
Barn Swallow	April 13	April 19
King Bird	April 13	May 2
Bobolink	May 1	April 30
Chimney Swift	May 1	April 30
Baltimore Oriole	May 1	April 30

* I did not see this bird myself nor did I see any before April 21.

The latter part of this spring has been in every way conducive to safe and speedy migration, fair, warm weather by night and day, no severe storms either of wind or rain and an unusual evenness of temperature. The weather—though not wet enough to cause speedy and profuse vernation—is at least very suitable for the germination and transformation of insect life.

As I spoke of the earliness of the spring of 1894 it may not come amiss to give a list of some of the arrivals of that spring,

	1894.
Bluebird	February 28
Robin	March 4
Flicker	resident
Killdeer	March 4
Red-winged Blackbird	March 4
Bronzed Grackle	March 4
Phœbe	March 18
Meadowlark	March 8
Chewink	March 22
Yellow Warbler	April 20
Chimney Swift	April 20

Of Bluebirds I have seen seven—with all my tramping—I literally live in the fields and woods and I think I saw two of these over, so five is doubtless the correct number. And as yet I have not heard a warble. They were plentiful enough last November, warbling away as though it had been spring. And with the Blackbirds, Killdeers and Meadowlarks were overtaken in the severe cold snap which came November 5th and lasted till the 22d of the month.

Then the weather was very fair and fine again until December 25. This peculiar sandwiching of such bittter weather—it reached 18 degrees above zero and snow lay during the seventeen days—between such pleasant spells seemed to fool the birds. Evidently there was not a thorough migration of some of the more lingering species many birds doubtless protracting their stay until departure was impossible.

The birds noted above as residents during this severe winter prove this I think.

On December 23 I found a Red-breasted Nuthatch in a bit of swamp. This species is recorded as wintering only in western Ohio. About this time some unknown "sea-fowl" as was thought was stranded in the neighboring town of Salem—unfortunately the writer did not get to see it—but it was evidently some water fowl, either flying to or from Lake Erie, almost 60 miles away.

December 27, mercury down to 14 degrees above zero I met a Sparrow Hawk in the woods where he was evidently watching a large flock of Tree Sparrows, *Spizella monticola*. *Junco hiemalis* appeared early in September, notwithstanding the mildness of the season. While during the winter I saw great numbers of Snowflakes, *P. nivalis*; more in fact than I ever saw before. Several flocks which must have contained between two and three thousand birds.

That the autumnal rains which came after the long summer drought had their effect on migration there can be little doubt. New verdure put forth, new grass, leaves and in many cases flowers.

I noted eleven species of plants sending up new stalks, with bloom in November. A Choke Cherry, *Prunus virginiana* produced abnormal inflorescence; instead of the long racames the flowers were gathered in short dense heads. The peduncle being shortened to less than half an inch the pedicels almost entirely wanting. Found this November 4.

On September 14 found a Locust tree, *Robinia pseudscacia*, nearly dead one side of which had six racemes of white sweet-scented flowers—carrying me back to spring with a vividness which only scents can. Fruit trees flowered, and here and there a grape vine thrust out fresh tendrils, bloomed, and had ripe and green fruit and flowers all at the same time. This freshness could not help having effect on the insect world—consequently upon the birds. It was a sort of secondary spring. This is the manner in which I attempt to account, in a measure, for the tardy, and in some cases, omitted migration. The Bluebird is not able to stand very severe weather. I have seen them come to the house in March, 1894 and peck at the Ampelopsis berries during a slight snap of winter, and a few days later found several dead in the orchard evidently frozen.

It would be interesting to know how far north, and how late in November or December the Bluebird was seen last, or noted through a long period of the past winter. Who is able to draw that wavy line across the map of the United States, which fixes his ordinary winter limit northward? Not any one of us, but perhaps all of us might help. We don't know much concerning the internal action of the "laws" of migration after all. Many things unknown seem to enter into the problem. It is one of

the most complex. One must be an all-around naturalist to observe its actions and learn anything about it. And when he thinks he knows it all pretty well—he learns something else! If we could only have a more united action—say a chain of observers almost parallel across the country every twenty-five or fifty miles; it would be a decided advance. Chains of swamps, water courses, chains of lakes, well wooded strips of land, fertile sections and lines of hills trending northward—we would find out the value of these and many other unknown conditions in their influence on migration.

It is to be hoped that this calamity of our Bluebird will turn to some good conclusion the observation of many scattered and isolated naturalists.

ERNEST W. VICKERS,
Ellsworth, O.

How to Mount Botanical Specimens.

The secret of obtaining fine specimens lies in drying them before decomposition has had time to take place, and applying as much weight as possible without injuring the more delicate portions of the plant. The specimens should remain in the press till all moisture is absorbed, which is, in most instances, about a week. In herbaceous specimens the entire plant is easily preserved. Bulbous roots may be managed with very little trouble by sectioning the root when too bulky. Succulent plants should be immersed in boiling water before being placed in the press. Each sheet should show specimens of both flower and fruit if possible. In the case of herbs, this can usually be done with one and the same specimen. When the seasons of flowering and fruiting are separated by some weeks, leaves should be preserved with each specimen, as the foliage often changes materially in appearance during that time. Where it is impossible to show the entire plant on a single sheet, the root and leaves should be shown in connection with the branches.

In drying, it is well to turn part of the leaves wrong side up, thus showing the appearance of both sides of the leaf; this is especially desirable in the fern family, if only one frond is shown. It is better to mount two or more leaves, and in that way give the different views.

Never mount more than one species on a sheet; variations of the same species may be placed together, as the violet self-heal (*Prunella vulgaris*) with its freaks of blush and white. For mounting, Linnæus used sheets of foolscap, but that size is now universally conceded to be too small for practical purposes. Most botanists prefer sheets 12x17 inches, and some use a double sheet. While this method protects the plant more it adds to the bulk of the herbarium and to its cost, and on the whole it is questionable whether the advantage gained by the use of the double sheet balances that lost.—*American Gardening.*

How to Use a Pocket Magnifier.

BY EDWARD PENNOCK.

Having frequently observed the incorrect and unsatisfactory method of handling even so simple an instrument as a pocket magnifying glass, in the hands of those unaccustomed to its use, and knowing what excellent and satisfactory results can be obtained by its proper management, the editorial pen was inspired to write as follows, *to wit*:

Holding the object to be examined between the thumb and forefinger of the left hand, take the magnifying glass, ready for use, in the right hand, and bring it approximately to its focal distance from the object, resting the right hand against the left to avoid any unsteadiness. Bring the magnifier and object thus held in the hands, close to the right eye, and focus upon the object until a clear and distinct image is obtained. Care should be observed that the object, lens and eye, should be in a right line with each other, and that the lens should be held with its surfaces on a plane at right angles to this line, so that there will be no distortion or lack of clearness in definition. Of course, one should choose such a position as will permit of the light falling fully upon the object. It is much better to hold the magnifier close to the eye, rather than to hold it off at a distance therefrom, as in the latter case a very small field of view is obtained, with considerable distortion at the margins of the field; by holding it close to the eye, a broad, clear and distinct field is obtained.—*Queen's Microscopical Bulletin.*

Training a Butterfly.

I have failed to find any one who has ever seen or heard of such pets. Their short lives make them fleeting joys. Five weeks is extreme old age, and it is only by great care and tenderness the little life will last even so long. Surprising in them is the similitude to human nature. I hope it will interest those who see the beautiful and wonderful in insect life if I outline the life of the treasure of my flock.

On a cool October day, while walking in the park, I saw a large black and orange butterfly. It was so perfect and beautiful, although the frosty air had apparently taken its life, that I carefully put it in an envelope and took it home. Reaching there, the butterfly was laid upon the table. Returning to my room several hours after, I was attracted by a strange scratching on paper. Going to the table I found to my surprise that the sound came from the envelope. With much care and gentleness I unfolded it, and out came my treasure. It was not dead, but had been chilled, and the genial warmth of the room, reviving the latent spark, gave me such a pet as I believe no one else in the world has ever had. My first thought was, it surely must be hungry. But how to feed it? How handle it? From nature's bounteous storehouse it lived upon the honey of the flowers, with little sips of water taken from the pools by the roadside. Remembering this, I prepared the feast for my welcome guest—a honey or syrup of white sugar in a tiny little saucer, and, in another some water. But how was I going to get him to eat? After much thought I decided the only way to handle him was to fold back his wings and take him by the shoulders. Next I took a number seven sewing needle, and placing the head of it very gently through the curled proboscis, slowly unrolled it, and as I did so the end of it fell in the syrup. Oh, what an untold feast for a half starved butterfly! After he had his fill, I loosened my hold and he at once commenced to remove the adhered sweets from his proboscis and forefeet, then his antennæ were polished, and lastly, having plumed his body (if you look through a magnifying glass you will see the butterfly's body is covered with minute feathers) he moved off like a man pleased with

the world. I, too, was happy, for if the little fellow would eat in this way, surely he would live his natural span. Yes, he revelled in a green old age.

For three days I continued to feed him in this manner, how many times a day I can not say, but it was often and often. I had not other duties to call me away, so three whole days was devoted to my pet. To my surprise, on the fourth day, when I went to feed him he flew upon it, and commenced to unroll his proboscis and to eat without my aid. Ever after that, I was his flower garden, his purveyor, or whatever the butterflies may call their storehouse.

Now we were fast friends and every day impressed upon me how like a human being in all his ways this insect was. I kept plants in the room, and these were his resting place; but when the bright sun shone in the window, he would fly around as in the days of his outdoor existence. When I came into the room, he would fly to me, lighting upon my hands, my arms or on my chest. This also would he do if I were sitting in the room reading, writing or sewing. These attentions were always reciprocated by my offering some refreshments. Generally they were accepted. If I placed him on a table, or any flat surface, and then drew my finger along, he would follow it like a kitten, in every direction, not flying, but keeping up a continuous walk; and then, when I started to leave the table, he would turn his head as knowingly as a child or an animal.

So thoroughly versed was my butterfly in the ways of my home that I could take him from room to room, and even show him off in the drawing-room when I had callers. After the greetings were over, I would place him on the lace curtains for safety, lest in pleasant converse he might be forgotten, which might have meant death to him and never ending regret to me. I am quite sure you will think him a dissipated butterfly when I tell you of his strange ways at night. More than once have I had to feed him after 10 o'clock. When turning the gas up he would wake, fly toward me, and unroll his proboscis. I had not the heart to refuse his call for a drink or for something to eat, so would sit down by him until all his wants were satisfied. In the meantime, I was weary for sleep, and wondered if ever before a tired sleepy woman had been known to sit up with a hungry butterfly.

In three weeks came the first signs of approaching age. It was in the dullness of the bright coloring and gloss; a few days more, wrinkles appeared on the body and wings, and after eating he was not so particular to plume himself. Next, the appetite was wanting and each day the strength failed. The last week or ten days of his life I had to feed him like an infant, unrolling the proboscis for each meal, and after I thought he had fed long enough take a camel's hair brush, dip in tepid water, and wash his proboscis, antennæ and feet. No longer did he constantly move about, but was satisfied if near me, to crawl over my hand. The three days before he died he was in my hand nearly all the time, whether for warmth or love I can not say, and in my hand he died. To assure myself that I had done all that possibly could be done to keep him alive, I went to the library and there read what was to be learned about the butterflies, and happy was I to know from the care I had taken of mine, he had lived far beyond his allotted time.—*Miss P. M. Gonlee in Cosmopolitan.*

The Birds of Mackinac Island.

By Dr. Morris Gibbs.

Mackinac Island, lying in the straits of that name, between the lakes Michigan and Huron, is rightly situated to receive the transient visitatation of hordes of migrating birds both spring and autumn. Located in the waters separating the two peninsulas, at a point where the straits are less than eight miles in width, and at the jumping off point, as we may well say, of the lower peninsula, it necessarily follows that nearly, if not quite all, the species that pass through our state, should visit this picturesque and historical spot. In truth, it is not unfair to liken it, in its relation to migration, to the Rock of Gibraltar, near to which pass all species which are to reach Spain, and most of those which seasonally visit France and England. It is safe to say that a careful list of the birds of the island, together with a list of the migrants and those which pass near its shores, would largely exceed a list of any one of the southern counties.

The actual number of permanent resident birds on the island is very small, and without a doubt does not exceed six, and the winter season would indeed appear cheerless to a snowbound ornithologist there, were it not for the probable visitation of more northern species, which straggle southward irregularly, both as to numbers and as to time of visitation. There are without a doubt one hundred and sixty summer residents on the island of which at least one hundred and forty are regular. In addition to these, there are probably as many more species which visit and pass by the island during migrations. Of the transients we know nothing and this estimate may be too high, but I think it will be eventually proven that this number is to be increased. Reasoning from analogy we may claim that all of the ducks and littoral species, as well as a great many land birds, that we know pass north of our confines to breed, pass over the water at this spot.

Whhn I first visited the island in June, 1885, there was nothing to be seen but crows and gulls on our approach, and I was told on landing by a resident, that no other birds existed there during summer. Yet within twenty-four hours I had recorded forty-two species, without having recourse to my gun.

The island is largely covered with small coniferous trees and dense underbrush. In many quarters are regular forests, but there are few large trees. Excellent protection is afforded the smaller birds, and as a consequence they breed there in great numbers.

Mr. Stewart E. White and his brother Gilbert White spend the summer months there, and have compiled a careful list. This list, with my own, after my last visit in August, 1891, embraced nearly one hundred and fifty species. * Of the recorded birds, the warblers took first rank as to numbers, there being twenty-six species. The Hermit and Swainson's Thrushes breed plentifully. One of the commonest birds is the Cedar Waxwing.

No one qualified for the work has been there during migrations, nor yet during the winter, I believe, and there is an excellent opportunity for observation at this point.

* Catalogue of Birds of Mackinac Island by S. E. White. *Auk*, July, 1893. (143 species embraced.)

PUBLISHER'S DEPARTMENT.

An Open Letter.

Edttor of Natural Science News:

In your issue of April 13, 1895, is an article by Will C. Hall Esq., which, though painstaking, and indicative of the efforts of a thougtful man and scholar, nevertheless does an injury to my process, by casting doubt on Embalming as an artistic method of mounting.

It is but fair to say that the process of Embalming is not needed by first-class taxidermists who have spent years learning the art. But the method of Embalming is so much superior to the work of thousands of so-called Taxidermists in America, that comparison might prove invidious.

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My method is a boon to thousands who wish to learn quickly, and at the smallest cost; and as well, there is not a taxidermist in America who could not pick up valuable points in following it.

Respectfully Yours,
MORRIS GIBBS, M. D..
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To Dealers and Collectors: Will furnish small Fossils, Shark's Teeth and Corkscrew Fossils from Stafford Co., Va., for $1.50 per 100. The fossils are something new and unique. GEORGE W. KIRTLEY, Fredericksburg, Va. Ao-10n-e3mo.

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JOHNS HOPKINS UNIVERSITY,
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E. H. HARN, Collector.

If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large, movable water drops, as large as peas; **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

Rutilated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Columbite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Octahedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address.

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Box 262. **Blairsville, Pa.**

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NATURAL SCIENCE NEWS

VOL. I. No. 17. ALBION, N. Y., MAY 25, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED.—A good Bicycle. Will give an A No. 1 E flat Stratton Horn and some cash. Address BOX 31, Gaines, Orleans Co., N. Y.

A LARGE number of poultry papers to exchange. Also fine Light Brahma stock for sale or exchange. Circular free. Wanted books on birds, eggs, egg calipers, etc. Also an $8 World Typewriter (used very little) to exchange for second hand copy of Coues' Key. W. G. STUTZMAN, Kent, O.

FOR SALE CHEAP.—A collection of about 100 first class eggs. Worth $10. Will sell *very cheap*. Write for price and list to H. R. GRAHAM, 2106 Spring Garden St., Phila., Penn.

MAKE ME an offer in good sets for either a mounted Tarantula or Horned Toad. K. B. MATHES, Albion, N. Y.

TO EXCHANGE.—Morris Gibbs' Embalming Compound and directions unused for Davie's Nests and Eggs of North American Birds. ELMER FALK, Stoughton, Wis.

BEAUTIFUL long green Vermont mosses, to exchange for natural or manufactured goods. Catalogues, samples of publications &c. solicited. FRANCES S. DAMON, Lyndonville, Vt.

SHELLS and marine curios in quantity to exchange for good sets of eggs. K. B. MATHES, Albion, N. Y.

STAMPS. Chili Tel. 3 var. 5c; Egypt 8 var. 10c; India 8 var. 10c; Peru, 1886, 4 var. 5c; Cuba, 1894, 6 var. unused, 8c; Hungary. 1888, 8 var. 10c; 100 foreign, 10c (all different). CARL YOUNG, 72 First Place, Brooklyn, N. Y.

WANTED.—Insertion barrel for 16 bore gun, 5 in. fine scissors and a small hunting knife. Have back vols. OOLOGIST and Indian relics. ALBERT B. FARNHAM, Benning, D. C.

WANTED.—A No. 2 or C Daylight Kodak. Must be in *good* condition. Will give a fine series of eggs of Hawk's and Owls. J. P. FEAGLER, Waterloo, Ind.

ELASTIC Sandstone. I will send fine specimens at the rate of 4c per square inch postpaid. If you want Natural Science specimens from this locality. Address with stamp. P.R.CAMP, Marietta, Ga.

WILL Exchange a 4 keyed flute, cost $4.50, with instructions, for fine sets or A 1 bird skins to value of $4 ERNEST H. SHORT, Gaines, Orleans Co., N. Y.

FOR SALE.—Indian Arrow and Spear Heads at 25 cts per dozen. Send for a sample dozen. Will exchange a few for fine sets at ½ rates. GEO. W. DIXON, Watertown, S. D. O.

LARGE Collection of Ancient Indian relics, including mortars, pestles, gorgets, pendants, discoidals, spears, etc. for sale cheap. Interested parties write for outlines, etc. A.GRUTZMACHER, Mukwonago, Wis.

NEW BOOKS.—Ridgway's Manual; Davie's Nests and Eggs, cloth; Our Birds in Their Haunts, cloth; Maynard's Naturalists Guide. Best offer *cash*. (stamp). GEO.W. VOSBURGH, Naturalist. P. O. Box 307, Columbus, Wis.

WANTED.—Minerals, Shells and Gem Stones (in the rough). Have Minerals, Fresh Water Shells, Fossils and arrow heads also *Scientific American* with Supplement and other papers to exchange. Please send me your list. All answered. CHARLES MILLER, JR., 216 Jefferson St., Grand Rapids, Mich.

TO EXCHANGE.—A complete set (13 volumes) of Pacific Rail Road Reports, for camera or type-writer. Write stating particulars. All letters answered. SHELLEY W. DENTON, Wellesley, Mass. 16-2t

COLLECTION of 800 rare stamps for sale, or exchange for set of dissecting instruments. P. S. MERTINS, Lexington, Va. 16-2t

FOR SALE.—A No. 2 Kodak in good order for cash or part cash and part in instruments. Make offer. All letters answered. A. GORDON LEAVITT, St. John, N. B. 16-2t.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Addresses of collectors of Relics, Indian Relics, Coins, Stamps, etc. State what you need in this line All letters answered. A. CLIFTON SHEPLEY, Canton, Ill. 16-2t

SCHUYLER TRAPS for collecting small mammals. Price *prepaid*, each, 15cts; two for 25cts. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

I HAVE 1500 small T perches. 3 inch base, oak fine finish 8c each; pine painted white at 6c each. Will take half cash and balance in exchange. I will turn any kind of T perches, round flat stands, bases for glass shades or anything in the line at a very low price. Write for prices. E. L. HALEY, Phillips, Maine.13t5

$.50 WORTH for nothing.—I will give $1 50 worth of minerals, fossils or Indian Relics, well selected and labeled, postpaid for 17 6c Columbian Stamps unused. Send for price catalogue L. W. STILWELL, Deadwood, S. D. tf

ALLIGATORS. We now have among this spring's collections a fine lot of Alligator Skulls, Teeth and Skeletons. Also skins, live and mounted Alligators, "Gator" Oil, "Gator Musk and "Gator" Leather. These "Gators" were all secured by ourselves on collecting trips and have been prepared in first class shape. We will sell any of them cheap for cash, or will exchange for any of the best works on Natural Science. For 50 cents we will send you a large polished "Gator" tooth dog call or whistle Address THE EBERSOLDS, Oceanus, Brevard Co., Fla.

PALMETTO Scrubbing and Dusting Brushes. Fly Switches, Plain or Fancy Braid for Hats, very durable Fans and Mats. Made at home on rainy days. Send 25 cents for samples. THE EBERSOLS, Oceanus, Brevard Co., Fla.

SECOND HAND BOOKS.—I want 2d hand copies of Packard's "Guide to the Study of Insects;" Coues' "Key to North American Birds" and other Standard works relating to Natural History. FRANK H. LATTIN, Albion, N. Y.

CANOE YAWL "ACORN," built by St. Law. Boat Co., in '93. Length 18ft, width 4ft; rowing and sailing outfit complete; good as new, worth $150, will sell for $80, *cash only* Corresponence from parties meaning business solicited. CHAS. W. REED, Gaines, Orleans Co., N.Y. tf

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WANTED.—Eggs in sets or large singles. For every 15c in eggs sent I will send egg drill. OTIS TROTTER, Hillsboro, Ill.

TO EXCHANGE.—A collection of 400 good foreign stamps and about 300 duplicates, catalogued at $18.50, for best offer in U. S. stamps. Send for list and state what you have. W. C. ACKISON, Charleroi, Pa.

WANTED.—Live small animals and birds, native or foreign, single or in pairs, young or old, in good condition such as striped gopher, young opposum, young porcupine, young skunk, (with scent bag removed), prairie dog, squirrels, young fox, young woodchuck, etc., and any bright colored or odd appearing birds such as woodpeckers, wading birds, tanager, oriole, blue jay, owl, eagle, hawk, blackbirds, kingfisher, plover, snipe, heron, sandpiper, etc.; also large harmless snakes. Write lowest cash price. J. MUNSELL'S SONS, Western Ave., Albany, N.Y. 17 2t

TO EXCHANGE.—Birds eggs in sets and singles from this locality. 1st class and with data. For eggs of other localities and coins. HARRY. W. ROBERTS, Lancaster, N. H. 17-2t

TO EXCHANGE.—40 U. S. and foreign stamps worth from 2 to 12 cents each to exchange for best offer in two cent pieces between 1864 and 1872 or foreign coins. HOWARD HIXON, Washington, Pa.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa.4yr

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INSTITUTION FOR NATURAL HISTORY,

Emdener-Str. 4, Berlin, N. W., Germany.

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Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12.22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00

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Do you want to learn of a method that requires absolutely no tools excepting a file, knife and wire, and no additional expenses, trying to the new beginners of small means?

If so, then send 75 cents for complete instructions, and one pound of Embalming Compound, enough for preparing 30 to 40 small birds.

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J. G. GRAY, Assignee for

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SELF-INKING RUBBER STAMP.

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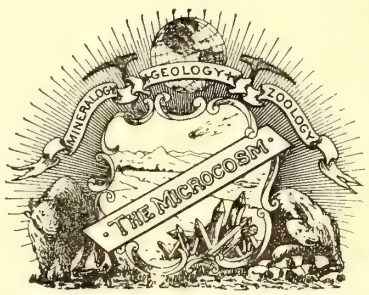

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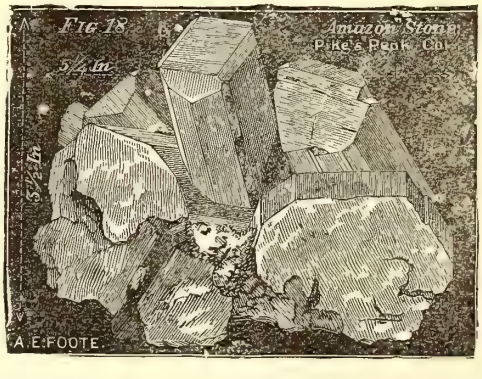

Recent Additions to Stock.

QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

Send for our complete list of new arrivals.

Price Lists and Circulars Free.

(In ordering book catalogues, mention the subject in which you are interested.)

"Catalogue of Minerals,"

fully illustrated, 128 pages, 10c; bound, 20c.

FROM THE "COPPER QUEEN" mine in Arizona, we have just obtained the most beautiful, gem-like crystals of AZURITE, which with tufts of velvet MALACHITE are scattered over stalactites of Wad and Limonite. The crystals exhibit a new habit and their arrangement over the Limonite surface is most novel and striking.

Also, *Cuprites* in large octahedrons: delicate blue *Chrysocolla; Stalactites* with an exquisite tinting of pale sea-green color.

Most of the above can be furnished in cabinet specimens at 25 cents and upwards, the price being determined by quality and rarity.

Always mention NATURAL SCIENCE NEWS *when answering this ad.*

Natural Science News.

VOL. I ALBION, N. Y., MAY 25, 1895. No. 17

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

Entered at Albion P. O. as 2nd class mail matter

Photographic Suggestions.

Recognizing the fact that the camera is becoming an important feature in the collector's outfit. I trust that a few words to the beginner on photography in the NATURAL SCIENCE NEWS will not come amiss.

After having selected your outfit, the next consideration is the dark room. If you have no place to make a regular dark room the cellar will do very well in summer. In fact I have developed plates in a cellar in weather that would render an upper room simply impossible to work in without ice—on account of the heat fogging the plates. Every care should be taken to make it perfectly light tight. A perfect dark room should be supplied with running water, a good safe light, means of ventilation to carry off poisonous acid fumes, sink, etc.

The best as well as the cheapest means of obtaining a good safe light, is to take a box about 12 in. square and 18 in. tall, make a frame door (similar to a screen door) and cover it with red or orange paper, double. The box must be provided with a hole in the top and some in the bottom or back for ventilation. Use an ordinary lamp inside. By fitting a common stove pipe over the hole in the top, and extending it out of the dark room, you have an automatic ventilator. If the amateur has that happy faculty for "making things" he can make trays, for a few cents, equal to those sold for $2.00, as follows: Make a box with sides two or three inches high of any convenient size and line it with common white oil cloth carefully folded at the corners, and tacked on the top edges of the sides.

After making the exposure the most important point is development, and one cannot be too careful if he wishes to secure even moderate results. Chose one process, *and stick to it.* Do not keep changing formulae, dry plates, paper, etc., but take some standard formulae and work it until thoroughly acquainted with it. That is the quickest way to succeed.

The market is filled with new developers, but pyrogallic acid holds its own, and seems likely to for some time to come. A good pyro formula will be found in every box of dry plates, and they are all practical. The difference lies in the manipulation.

Remove the plates from the plate holder, dust carefully with camels hair brush (or if you have no brush you can make a scraper by taking a piece of thin wood, with a straight edge, and covering it with velvet. Use this carefully and you will not be bothered with the little spots called "pin holes.") Place the plate in the developing tray and flow quickly from side to side with developer. The tray should be kept covered from the light except when examined. If a proper exposure has been made, the image will gradually appear, and then take on the density desired. The proper way to judge of density is by transmitted light, but when you get used to your plates you can tell when they are fully developed by the outlines showing on the back.

After fixing in the hypo bath until it clears—or the white disappears from the back—wash in several changes of water for two or three hours, or in running water for half an hour. If it then appears thin with no opaque black parts it has not been fully developed. This is just where most beginners get left. In case of over-exposure it will seem to flash up quickly with a general lack of brilliancy. A few drops of a solution of Bromide of Potassium (½ oz. to 5 oz. of water) added, will keep it back, if not too badly over-exposed, in which case better throw it away and try again.

For normal exposure use cold developers in summer and warm in winter. After developing, the developer is then called old. For the next plate use old and new mixed, three parts old to one part new, or mix old and new in proportion to the exposure, remembering that the old works slower, giving more contrast.

Under-exposed plates develop slow, lack detail, and give great contrast. Use more alkali and less pyro.

Volumes have been written on this subject, and every one who has had a year or two of experience has a favorite formula which he will assure you is the only correct one to use, but the foregoing will—I hope—set each one to thinking it out for himself, and practice will make perfect.

PRINTING.

Now a few words as to papers, as much depends on proper printing from good or poor negatives.

Very pretty pictures can be made from strong negatives on blue paper, and it is very inexpensive. One yard 27 in. wide, cut to any size, will be sent by mail, prepaid, for 25 cents, by the Obrig Camera Co., New York.

In order to secure the finest detail silver paper should be used. There are three distinct kinds, Albumen, Gelatine and Collodion. Albumen paper should be freshly sensitized and fumed with amonia before printing. It will keep fresh only two or three days. Silvering it will be found to be a difficul ttask, and I would strongly advise any one to use the new and popular aristo and other papers rather than have anything to do with silvering.

Gelatine paper has many disadvantages, and nearly always requires a hardening bath.

Collodion paper—the kind that does not curl—will be found to be the most satisfactory, and is easily worked. It comes ready to use except it should be trimmed before printing. If a number of prints are to be made from 4x5 negatives, it is best to cut the paper to 3½x4½ before printing, then no trimming will be required.

Please bear in mind that I write this with the sole aim of helping beginners, and although it appears to weaken an article by giving preference to certain firms I would have been well pleased to have

caught some practical ideas when I first began, and thereby saved me a vast amount of annoyance and failures. I have made a trial of 14 brands of photo. paper, and unhesitatingly recommend that made by the Ilotype Co., New Brighton, Staten Island, N. Y. For sale in every state in the Union. Ilo requires but one bath and not one-third the amount of gold that Albumen paper requires to tone. It is universally acknowledged, that a combined toning and fixing solution gives just as beautiful and permanent results, and perhaps more so than separate baths.

Kosmos is another good paper. It does not sink to the bottom like gelatine paper, but curls slightly at the ends, just enough to keep the prints separate, and making easy work of washing, etc.

After they have been toned and thoroughly washed take them out one at a time and lay them face down on a paper, squeeze the water well out of them, and mount while still moist with thick starch paste.

All of the new papers look quite well before burnishing but a burnisher gives a remarkably gloss entirely unlike albumen.

The platinotype process is very largely used at present. Prints similar to blue paper, but giving black and sepa tones, and most artistic effects.

A. S. McKeen.

Aquaria.

An aquarium is not only an ornament, but is instructive and interesting. It is particularly adapted for the sitting-room, library and dining-room, and many times has been introduced into the sick-room, giving pleasure and enjoyment also to children who delight in watching the motion of the fish and growth of the plants.

The care of gold-fish is very simple; they require but little food, a few sheets of which will last a long time. Care, of course, should be taken not to put more food into an aquarium than the fish will consume within a reasonable length of time. Feed a little two or three times a week; this is all that is necessary, according to the number of fish in the aquarium, which should never be overcrowded with fish or plants. Allow two gallons of water for three gold fish of the average length, three inches, (of course the larger the fish, the more water they require). Small size fish are recommended. Fish should never be handled except with a net.

In regard to changing the water, this depends entirely on circumstances; in a cool room, where the air is pure, three fish will live in two gallons of water for two or three months, perhaps longer, without changing; in a warm room they will require fresh water oftener. (I am now speaking of globes.) Care should be taken in changing the water not to bruise the fish. Pour off the water carefully, and pour in slowly the fresh water which should be as cold as possible. If you keep the aquarium in a cool place, exposed to the sun a portion of the day, and stocked with the proper quantity of plants, the water need not be changed; they have been kept for years without removing the water. A four-gallon aquarium will stand for months without changing the water, larger ones in proportion. Simply add a little water each day, as it evaporates, and keep the aquarium close to a window, so the average temperature will not be more than sixty-five degrees; the colder the better. Pebbles in the bottom of an aquarium, also a grotto or imitation stone arch, add greatly to its beauty. These give it the appearance of a miniature lake; and with plants, etc., can be arranged very artistically by one who takes an interest and pleasure in doing so.—*From a Circular by J. W. Fiske, New York*

General Directions for Microscopic Work.

By E. S. Bastin.

Prof. Botany, Phila. College of Pharmacy. [From *College Botany*, pp. 218-9.]

1. Acquaint yourself thoroughly with the mechanism of the microscope you are to use.

2. Observe great care in the removing and putting on of objectives, so as not to drop them, for they are delicately constructed and liable to injury. The eye-pieces and eye-piece micrometer should also be handled with care.

3. Observe care in focusing, particularly when high powers are used, so as not to run the objective down against the slide and endanger either the cover-glass or the objective itself. Be sure also that you focus the microscope accurately, otherwise the structure of the object will not be distinctly seen.

4. Give due attention to the adjustment of the reflecting mirror, so as to secure the most favorable illumination of the object. Much of your success in seeing fine details of structure will depend upon the care exercised in this respect.

5. Bear in mind that many of the reagents used are corrosive and hence should not be brought into contact with the microscope. All the acids and iodine reagents will act upon brass work, potassium hydrate will corrode glass, and alcohol will remove the lacquering from the stand.

6. All objects examined in liquids should be covered, not only to obviate the danger of injuring the objective, but to avoid the inevitable distortion of the image which a curved or uneven liquid surface produces.

7. Let cleanliness and care characterize all your work in the microscopical laboratory. Keep all your apparatus, slides, cover-glasses, etc., scrupulously clean. Do not touch the glasses of the objectives or eye-pieces with your fingers, for that would be to soil them and impair their optical performance. Whenever they need cleaning breathe upon the glasses and wipe them either with a piece of perfectly clean and soft linen cloth, or with a piece of the thin, soft paper that is sold at dental supply stores under the name of Japanese filter paper. A convenient way is to keep always at hand, in a place secure from dust, quantity of this paper cut into suitable sizes. It is useful, also, for cleaning cover-glasses, slides, etc. If a fresh piece is used each time for cleaning an objective, there will be little danger of marring the polish of the front lens.

Keep the bottles containing reagents, staining fluids, etc., stoppered, when not in use, so as to exclude dust and prevent evaporation; and take especial care in using them not to introduce impurities into them.

8. In cutting sections the razor or section knife should always be very sharp, and for most purposes sections should be cut quite thin. Steadiness in cutting is secured by resting the wrists against the body. The knife should be given an oblique or sliding motion when drawn through the object. Quite hard tissues may be successfully cut if the sections are cut quite

thin, but if the edge of the knife is allowed to run too deep, it is liable to be notched. Portions of thin structures like leaves, petals, etc., may readily be sectioned by placing them between pieces of elder or sunflower pith. Always clean the knife after cutting with it, and do not allow fragments of tissue to dry upon it. Sections of fresh tissues, or of those that have been preserved in any of the pre servative fluids, should immediately be place in liquid after cutting, to prevent air from getting into the cells.

9. In all your work with the microscope, proceed understandingly. Endeavor to know the reason for every test you are called upon to apply, and be careful in interpreting the results of each test. Do not rest satisfied until you thoroughly understand every tissue and structure given you for study.

10. It is excellent practice for the student to keep an accurate record in writing, and by means of drawings, of all the facts observed and the work done by him in the microscopical laboratory. —*Microscope.*

Remarkable Archæological Discovery of Recent Years.

Vast and wonderful are the treasures which the spade, that humble instrument of toil, has brought to light in recent years from the ruins of cities buried beneath the dust of many centuries—buried so deep and so long ago that their very names have passed out of the records of man, and even the learned antiquarians who study over the upturned relics of by-gone times are at a loss to know where or what the link may be connecting them with modern civilization. Stranger than the strangest fiction, and more marvelous than the dreams of the poets, are the discoveries made in the under-world by the busy, patient, plodding scientists of these modern days. It is a saying that of "human mold we reap our daily bread."

So has been revealed to us by the archaeologist the equally startling fact that we are literally walking day by day upon the very tombs of a buried race of men. This is true, even here in America, which we are wont to think of as a new country, a virgin land, whose whole history dates back only a few brief years. As a matter of sober and scientific fact many of the richest and rarest archaeological "finds" of recent years have been right here under our so-called "primeval forests" and the "virgin soil" of our valleys and uplands.

It was only the other day, in a rock-hewn tomb down in Southern Mexico, that there was found a bronze and hammered iron sword, bearing on its blade and handle—in rich inlaying of silver—characters of record and representations of life distinctively Assyrian and Grecian. The roughly hammered iron blade showed the crudity of the early days of the iron age, but the exquisite inlaying of silver on the bronze bore testimony to the cunning of the silversmiths who wrought the weapon. To all appearances, and according to the inscriptions, it was a royal arm, for on its ample hilt it bore in horizontal lines the crowned head of its evident wearer, while below, in cuneiform characters on the blade, were apparently the title and name of the sovereign. The sword and scabbard weighed twelve pounds, of which the sword alone represented two-thirds of the total. How a Chaldean sword could find its way into the tomb in Mexico is more than any one has been able to conjecture.

All over the Central and Southern Mexico there are relics of a departed race whose annals antedate even those of the Aztecs. Antiquarians have endeavored to read their history in the stones of Tula, which was the old Toltec capital, now a place of ruins. Old Tula is now overgrown and half hidden from sight. San Juan Teotituacan also is famous for its two great earthen, pyramids which stand out on the plain, a half mile apart. One of them was dedicated to the sun, the other to the moon. The earth for miles around is filled with small images—caritas—insomuch that it seems as if these ancient people spent most of their time in making them.

A marvelous story is that which comes from Arizona, where a few months ago some prospectors in the Bradshaw Mountains came upon a cliff dwellers' village in one of the most inaccessible canons of that range, the largest village of the kind ever yet discovered. Several of the houses were explored and large quantities of pottery and some instruments, evidently used for cultivating the soil were found. In one the skeleton of a man, not over four ft. eight in. in height, was discovered. The canon at this place is half a mile wide and shows evidence of having been cultivated. If this theory proves to be true, it will throw more light on the habits of this little known people. So far as known no other evidence has ever been discovered of cliff dwellers having cultivated the soil. An Austrian student, Herr Low, who has been traveling in Central America, has recently obtained and forwarded to the Imperial Museum in Vienna twelve large stone slabs bearing foot prints in the solid rock taken from the quarry over Lake Managua, in the territory of Nicaragua.

These foot prints had been overlain by eleven different layers of stone, extending to a depth of four meters, and indicating an antiquity for our race quite transcending all conjectures hitherto hazarded. They are about three-quarters of a meter square and are sunk into the stone to a depth, of from eight to ten centimeters. The footprints are said to be very conspicuous, and seem to be those of three distinct persons, one of whom was a child. To what race or what age they belonged no one yet has ventured to guess.

Curious and puzzling as anything brought to light in recent years was some ancient handiwork found not long ago in making excavations for a canal connecting lakes Eustis and Dora, in southern Florida. The first excavations revealed the existence of a clearly defined wall lying in a line tending toward the southwest, from where it was first struck. The wall was composed of a dark-brown sandstone, very much crumbled in places, but more distinct, more clearly defined, and the stone more solid as the digging increased in depth. The wall was evidently the eastern side of an ancient home or fortification, as the slope of the outer wall was to the west. About eight feet from the slope of the eastern wall a mound of sand was struck, imbedded in the muck formation above and around it. This sand mound was dug into only a few inches, but enough was discovered to warrant the belief that here on the northwestern shore of Lake Dora is submerged a city or town or fortification older by centuries than anything yet discovered in this portion of Florida. Small, curiously shaped blocks of sandstone, some of them showing traces of fire, pieces of pottery, and utensils made of mottled flint, were thrown out by the men while working waist deep in water. One spear head of mottled flint, five

and a half inches long by one and a quarter inches wide, nicely finished, was taken from the top of the sand mound, and about four feet below the water level of the lake.

But in no part of this country, perhaps, has so many valuable "finds" been made as in the territory of New Mexico. All this region seems to have been thickly peopled ages ago by a highly civilized race. On the highest point of great Patrero de las Vacas of New Mexico, are the most remarkable prehistoric relics that have been discovered, being no less than the gods sculptured in stone that were worshiped by the ancients. These are the statues of mountain lions carved from a volcanic rock. The images are inclosed in a rude and almost circular stone wall, in a space fifty feet in circumference, three feet in height, with an entrance projected eighteen feet toward the southeast three feet wide. The lions face directly toward the east, are two in number, separated by a space of twelve inches, and are each six feet in length, and represent a puma or mountain lion in the act of crouching for a spring. The heads of these statues are almost entirely destroyed, showing plainly the marks of the pious hammer that sought their overthrow. The legs, bodies and tails of the animals are better preserved, and constitute the remains of the most remarkable stone images set up for pagan worship in the territory of the United States. To these gods the Cochita Indians of the present day pay homage.

Turning now to the old world, we have to note some interesting discoveries made recently by the "men of the spade." One of these was of Planella-Setteimini, near Pompeii, on the property of a certain M. Vincent de Prosco. A house has been unearthed that was covered at the time the city was buried, and it is said to be in a more perfect condition than any building yet discovered. It contains several large apartments, and three ball rooms, with the basins in sculptured marble, and with leaden pipes ornamented with bronze faucets. The three rooms correspond, says a writer, in describing the discovery, to the "calidarium, tepidarium and the frigidarium, which were always to be found in ancient houses of the first class. In consequence of the eruption in A. D. 79, the Pompeiian, houses brought to light heretofore have been of little value from an archaeological point of view. Fortunately however, that on the property of M. de Prosco is perfect, and archaeologists are happy over the fact. The roof measures over forty-four feet in length."

A Roman villa has been discovered near Brading, in the Isle of Wight. The external walls, as at present cleared, measure about 52x37 feet, and inclose about six or seven chambers, with passages, etc., connected, there is reason to believe, with many others. In addition to tassellated floors, remains of hypocausts, flues, fresco paintings, roofing tiles, coins, pottery and other interesting relics, there are the remains of a mosaic pavement, with a design upon it of unusual character, and one which is worthy of careful study and attention. The design, though grotesque, is doubtless symbolical, and may be connected either with the mythology of the ancients or the early introduction of Christianity. Moreover, as a new chamber has been opened up, inclosing an interesting mosaic, the central design of which is a representation of Orpheus playing on the lyre and surrounded by animals, as usual. The border is an unusually good example of what is known as the guilloche pattern. Pottery, glass and cloths have also been found, among the latter several brass coins of the reign of Victorianus, A. D. 268.

The archaeological researches in Rome of recent years have thrown much light upon the life of the early Christians in that city, but no discovery has produced such interest as that of the tomb of Amplias. Says Paul in Romans xvi., 8: "Greet Amplias, my beloved in the Lord." Who was Amplias? Who were his friends? Why was he buried in this particular place? The answer to these questions are all furnished by the discovery of his tomb, and a flood of light let in upon the times of the early Roman Christians. His tomb stands in one of the catacombs, excavated in the time of Domitian, on the ground then belonging to Flavia Domitilla, his niece Roman history preserves the fact that Flavia became a Christian. Amplias, the friend of Paul, must have been a distinguished man. The tomb is of such a character that only the possessor of great wealth could have constructed so remarkable a resting place. Was this the work of Flavia, the niece of the great Domitian? Was it erected at the cost of his family? or by the early Christians of Rome? These questions are not yet concluded. All that we know at present is that there is no tomb in the catacombs that equals it for beauty of its adornments and variety of pictorial illustrations.

In conclusion brief mention may be made of a number of other interesting and valuable "finds" of recent date. Space forbids giving of details. The earliest known statue is one that has just been recovered from an Egyptian tomb. It is that of a sheik or head man of a village, is evidently a portrait. It is 6,000 years old. Many hundreds of manuscripts have been recovered at Pompeii. They are charred rolls, but by the exercise of patience and ingenuity some have been unrolled and read. A skeleton of a prehistoric giant has been exumed at the old fort in Kentucky, twelve miles below Portsmouth, Ohio. It is six feet in stature and four feet across the shoulders. Several silver ornaments were found with it.

A remarkable discovery has recently been made in the Assiot necropolis. Among various objects was an entire company of wooden soldiers, some fifteen inches in height. These little figures give a complete idea of the equipment of the regular soldier in the time of the Pharaohs. The soldiers carry lances, which are precisely like those used in the Soudan today.

In a prehistoric cemetery, recently uncovered at Montpellier, France, while workmen were excavating a water works reservoir, human skulls were found measuring 28, 31 and 32 inches in circumference. The bones which were found with the skulls were also of gigantic proportions. These relics were sent to the Paris academy, and a learned "savant" who lectured on the find says that they belonged to a race of men between ten and fifteen feet in height.—CALDWELL, JOHNSON, in *New York Mail and Express.*

An Albino Pocket Gopher.

Mr. E. B. Webster, at Cresco, Iowa, has a pocket gopher collected this spring, which has a snow white head, white fore feet, white strip down belly and small white spot in center of back. The body is a trifle lighter brown than usual.

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My last notice more than paid me my subscription back in sales and exchanges of satin spar. C. E Houdyshell, Holton, Kans.

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I have used your columns to good purpose in the exchange of shells. Mrs. H. W. Ruggles, Milton, Mass.

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In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

From a little 35 cent adv. on this page in NATURAL SCIENCE NEWS of Feb. 9th Mr. Henry Clark of Gaines, N. Y., received cash orders for $15.50 worth of Ferrets.

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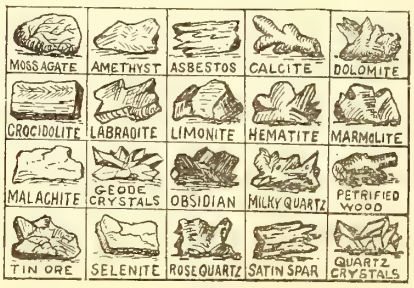

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NATURAL SCIENCE NEWS

VOL. I. No. 18. ALBION, N. Y., JUNE 1, 1895. Weekly, $1.00 a Year

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Niagara Falls.		6:35	8:05	11:18	1:40		6:00
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Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
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Recent Additions to Stock.

QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

FROM THE "COPPER QUEEN" mine in Arizona, we have just obtained the most beautiful, gem-like crystals of **AZURITE**, which with tufts of velvet **MALACHITE** are scattered over stalactites of Wad and Limonite. The crystals exhibit a new habit and their arrangement over the Limonite surface is most novel and striking.

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Natural Science News.

VOL. I ALBION, N. Y., JUNE 1, 1895. No. 18

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

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Among the presents to Prince Bismarck, the veteran German statesman, which recently reached Friedrichsruhe, his home, were two American bisons from the Cincinnati Zoological Garden.—*Ex.*

At Buffalo, N. Y., two Buffalo cows from Northern Texas have been added to the collection of animals at the North Park. Supt. McMillan made a trip to Texas, bought the animals and attended to their transportation in box cars. The buffaloes cost $500 each, and it is said the Texas owner has on hand several hundred of the animals.—*Ex.*

In the magnificent granite mausoleum which has been erected in California for the final disposition of the remains of Mrs. Fair and her family will repose the petrified body of her father, Mr. Thomas Rooney. His remains were interred first at Angel's Camp, Calaveras county, where the ground is heavily charged with silica, the result being they were soon petrified and attained a weight of 600 pounds.—*Ex.*

The Coral Snake.

Elaps fulvius,

A contributor in a late number of the NATURAL SCIENCE NEWS describes the pit before the eye which is one of the distinguishing marks of the *Crotalidae* and seems to imply that it is found in all venomous snakes, and that all serpents destitute of this mark may be handled with impunity. The writer of the article no doubt had reference only to his own section of the country, and in that case all his statements are correct.

There are places in the United States, however, where the man who would assume that all snakes destitute of the "poison pit" were harmless, and would take undue liberties with them would, sooner or later, fall by the wayside and be spoken of by his sorrowing friends in the sad pluperfect tense.

There is a family of venomous snakes known as the *Elapidae,* distinguished from the *Crotalidae* by the absence of the pit before the eye and the possession of a single erect *immovable* poison fang, grooved in front. Of this family there is a single genus, the *Elaps* known to inhabit America.

The range of this genus is from the Argentine Republic to the United States, where there is one species, the *E. fulvius,* sparsely distributed through South Carolina and the south and south-west, and a specimen of which was lately found in south-eastern Indiana.

The *E. fulvius,* commonly known as the coral snake, has an elongated cylindrical body, no apparent neck, and its head, which is little or no wider than the body, is covered with the nine epidermal plates usual among the Colubrid snakes. The eye is small, with round pupil, the anal plate is divided and the sub-caudal plates are bifid. The body is encircled by alternate bands of black, bright red and yellow, the yellow bands being so narrow that they appear like borders to the other bands. The red disappears posteriorly, the tail being marked with rings of alternate black and yellow, there being about four of each.

They are among the most brilliantly and beautifully colored snakes known. Darwin, in "Decent of Man," tells us of the surprise and admiration he felt when he first saw one of them in a state of nature in Brazil. He also discusses the origin of its gorgeous colors suggesting sexual selection as its cause. Believing, as I do, that snakes are color blind, I must conclude that sexual selection can have nothing to do with their coloration, and I am glad that the great naturalist dismissed his theory as lacking proof.

The coloration of the Coral snakes suggests the tropics. Their main habitat is within the torrid zone and their gorgeous hues seem out of place in our somber woods and fields. Still it is fully proven that this exotic serpent is a member of our Indiana fauna, and it is useless to quarrel with an established fact. Prof. A. J. Bigney, of Moore's Hill College, has a specimen that was captured in Ripley county, two miles from the village of Milan. Mr. Amos W. Butler, in the Journal of Cincinnati Natural History Society, gives an account of another specimen taken in Hamilton county, Ohio. These discoveries greatly extend the known range of this serpent.

The *Crotalidae* are so slow in their movements that they are helpless in the grasp of their non-venomous relatives, the common black snake, for example, but the Coral snake, though usually sluggish, is capable of killing and eating other snakes, as is mentioned in the *Encyclopedia Britannica* and also by Dr. Oliver P. Hay.

The serpent is so small and its short venom fangs are placed so far back that many observers have regarded it as harmless. Dr. Weir Mitchell speaks of it. I quote from memory, as "the beautiful Coral snake, the little *Elaps,* too small to do injury to man," yet there is abundant evidence of its ability to inflict dangerous bites. Prof. True in *American Naturalist,* 1883, p. 26, treats of its deadly powers. Prof. Coes in an article on the "Minor Venomons Snakes of Florida," in a recent number of the *Popular Science News,* tells us of a man who picked up one of these little snakes, and after playing with it for some ten minutes returned to his work. The snake had bitten him but had caused no pain, and both he and his companions called it "a harmless garter snake." In a short time, however, the venom began to take effect, and in spite of all that could be done he died in great agony.

Dr. Hay says that owing to the smallness of the serpent's mouth it would be impossible for it to wound a man, except on the fingers or toes; but if a bite on the finger causes death I would respectfully submit that this is enough.

ANGUS GAINES,
Vincennes, Ind.

Newspaper Natural History.

I am a firm supporter of popular natural history, but unless the articles on that subject disseminated by the dailies and weeklies of our land do not improve soon the results will be surprising.

The *Washington Star* furnishes shining examples of journalistic effort in this direction. Some years ago it published an interview with Mr. F. A. Lucas of the National Museum and quoted that gentleman as saying that the principal difference between toads and frogs was that one produced the young from an egg, while the other produced living young. I held quite a different idea from that. It also published from "an exchange" the past winter a hair-standing account regarding a *big bird*, which not satisfied with carrying off a little girl must tackle a hunter who though "loaded for ba'r" came off second best. Perhaps by this time it may have fallen into the clutches of some taxidermist or amateur, more blood thirsty by far than the W. Va. mountaineer.

The *Youths Companion* which certainly does furnish many good articles on natural history, published a very misleading statement a short time ago. In a few paragraphs on the seal herds of Behring Sea it is stated that the fur seal and sea-otter are one and the same. Such a statement, or rather misstatement could have resulted only from dense ignorance of the subject on the author's part.

Seldom, indeed, can the average newspaper account of an archaeological find confine itself to the truth. As the editor of the *Archaeologist* recently remarked of such an account, "the usual lie about the size of the skeletons spoiled it all."

A grave or two becomes a prehistoric cemetery; the site of a few Indian wigwams, ruins of an ancient civilization; an Indian fireplace or hearth where cooking was done, is a savage sacrificial alter, etc., etc.

Though accounts of swallows hibernating in the mud, and similar facts in ornithology and the other sciences have been discontinued there is still room for improvement. To be sure the public enjoy sensations and startling statements, but we can have them and still stick to facts, for all nature is full of marvels and wonders past finding out.

The papers mentioned are not, I believe, worse than most others, but merely furnished the examples most readily recollected. There is no better form of education in the natural sciences, for busy people, than concise, clearly written accounts in popular language, but writers of such should bear in mind the frontiersman's motto, "Be sure you are right, then go ahead." When science is not truth it ceases to be science though it may be popular in one sense.

Messrs Gibbs and Gaines have also referred to the absurd ideas regarding reptiles, often printed in our periodicals.

ALBERT B. FARNHAM,
Benning, D. C.

Lifting Power of Roots.

A Tennessee correspondent, signing himself "One curious to know," makes the following inquiry:—

There are here in the street sidewalks, which are paved with very heavy flag stone, shade and *Magnolia grandiflora* trees from twenty to thirty years old. The stones weigh from fifty to two hundred pounds each, and many over that, yet the roots of these trees. especially the magnolia, raise the flag and curb stone high, as if by hand or lever power.

Now, wherein is the powers."

The exact nature of these lifting powers has not been accurately determined, so far as the conductors of this magazine know. The immense power, however, has long been recognized. A mushroom has been known to lift a heavy paving stone in one night; but after all, this lifting power is not much greater than the sustaining power of the branches themselves. It must have often occured to observers that the leverage possessed by some of the horizontal branches of trees must be enormous. Just in sight of where this paragraph was written. is a horizontal branch of elm, extending at least thirty feet, and not more than three inches thick at the point where it starts from the main branch. The weight of the smaller branchlets which this has to sustain is probably not less than one hundred pounds. Yet it has taken that horizontal direction for some four or five years, and is still not an inch out horizontal line. There is a fine field for original discovery in this direction.—*Meehan's Monthly for May.*

Gum Thus for Mounting Microscopic Objects.

BY ARTHUR M. EDWARDS, M. D., NEWARK, N. J.

The use of a substitute for mounting microscopic objects instead of Canada balsam does not seem to have been looked for until I have found it in gum thus. Canada balsam was used from time immemorial for mounting—I do not know how long. But it is sticky and dissolves easily only in spirits of turpentine; besides it does not have a high refractive index as gum thus does, and higher still of oil of cassia or oil of cinnamon. Oil of cinnamon has a refractive index of 1.508, and oil of cassia has a refractive index of 1.626 to 1.647, while Canada balsam has a refractive index of 1.540 according to the table in Dallinger's compendium of the microscope. Best gum thus is soluble in weak aqua ammonia, the "household ammonia" of the shops. It is the resin of the loblolly pine (*Pinus tæda*, L.) and is called I believe white turpentine. It is also called frankincense. I use the gum thus dissolved in commercial alcohol and used as Canada balsam is, viz: the object is dried on the slide, and whilst warm, gum thus in solution is put on. The alcohol dries off, and when it is boiled off the cover unwarmed is placed with a forceps down on it. Rinsing is not necessary, but I find it convenient. Asphaltum is good but gold size is better. It can be cleaned off with aqua ammonia, borax or common salt, or even water if used in plenty enough. I have used gum thus alone with various other substances, as sulphur, phosphorus, oil of cassia, oil of cinnamon, monobromide of naphthaline, quinidine, borate of lead, chromate of lead, and other things. But gum thus alone is used constantly. In the *Observer* for January and June, 1893, are papers on the use of gum thus; and it is coming into use for microscopic objects, and will, I am sure, consign the Canada balsam bottle to limbo.—*Queen's Microscopical Bulletin.*

A Comma Bacillus.

Laura—Tell me, Uncle George, is that deformed gentleman, what is called a crook?

Uncle George—No, indeed. He is a bicyclist.—*Ex.*

Notes on Reptiles.

EXFOLIATION OF TURTLES. With regard to the articles of Messrs. Gibbs and Gaines in the NATURAL SCIENCE NEWS, I can add a few notes of my own. Only a few days ago, I picked up a common Painted Turtle (*Chrysemys picta,*) on which the horny plates of the carapace were so thin that the pattern of the bony plates beneath could be seen distinctly through them; this would point to an analagous case to that mentioned by Dr. Gibbs in regard to a Box Turtle.

On the other hand, I have noticed the horny plates on specimens of both the Painted Turtle and the Rough Terrapin (*Pseudemys scabra*) to loosen and come off, leaving brighter colored new plates beneath them.

FOOD OF TURTLES: Personally, I can only say that *Cinosternum, Chelydra and Aromochelys* are carnivorous, eating anything in the animal line that they are able to capture and also feeding on dead animals of any kind. *Chrysemys* I think to be at least partially a vegetarian; some I have now in captivity have apparently eaten Water Lily leaves;leaves and stems of arrow arum and bullrush leaves; while on the other hand I have never been able to get them to get them to touch flesh.

NUMBER OF SNAKES IN A BROOD; my observations have been mainly confined to the ovo-viviparous allies of the Water Snake, and so far they bid fair to give a definite limited number to each species, but a very wide variation for the group.

For instance, I find the number of developed eggs to be in *Eutainia saurita* 6 to 8;in *E.sirtalis* 24 to 95; in *Storeria dekayi* 10 to 25; in *Virginia valeræ* 6 to 7; in *Haldea striatula* 5 to 13; in *Natrisc sipedon* 30 to 50; in *Natrix leberis* 12 to 22; in *Storevia occipitomaculata* 12; the largest number I ever took from a snake being ninety-five from a Garter Snake, *Eutainia sirtalis* a few days ago.

NOTES OF ACRIS: in reply to a query in NATURAL SCIENCE NEWS, I would say that the notes of *Acris gryllus* do bear some resemblance to the rattling of pebbles.

C. S. BRIMLEY,
Raleigh, N. C.

"I never argy agin a success," said Artemus Ward. "When I see a rattlesnaix's hed sticking out of a hole, I bear off to the left, and says I to myself, that hole belongs to that snaix."

A Four-Footed Bird.

That there are still numerous chances for the indefatigable student and investigator to make new discoveries may be judged from the fact that the only known species of four-footed bird has been discovered quite recently.

This curious anomoly, which could very properly be styled an "*Avis paradoxalis*," is a native of the Amazon River country, its principal habitat being the islands of Marajo. It is only during the period of incubation,at which time the little embryo's extra legs and feet are seen at their best, and early bird-hood, that the four-footed feature is at all observable. Like the baby frog, which either "sheds" or absorbs its tail, the four-footed bird rids itself of its useless legs in the same manner, chicks six weeks of age usually being perfectly free from any signs of the extra members. The ornithologists profess to believe that this curious creature is a survival of some past geological epoch. Its scientific name is *Opisthocomus cristatus*. The natives call it the "hoactzin," which means the "evil-smelling bird." It is also claimed that there is not a carnivorous animal known that will taste its flesh. —*St. Louis Republic.*

Venomous Snakes.

I notice in the NEWS of May 4th an excellent article by Dr. Morris Gibbs on "Snakes."

The article should be read by all who have that inborn feeling of dread for all snakes and I am sure a study of our snakes by anyone cannot but interest them, but there is just one point which I think the Doctor has overlooked and that is that there is one venomous snake in the United States, which has not the pits in front of the eyes which mark the family *Crotalidæ*.

I refer to the only representative of the family *Elapidæ* which we have in the United States, I think, the *Elaps fulvius* or Bead Snake which occurs in the Southern States, none north of Virginia and Arkansas I believe, so that northern observers can safely judge by the presence or absence of the pit.

J. H. BROWN,
Iowa City, Ia.

Protective Mimicry in Spiders.

Prof. F. M. Webster in *Canadian Entomologist* for February, 1895 describes the mimicing of certain species of spiders—the excreta of birds on green leaves.

I observed last July a case of complete mimicry in the wandering or jumping spider *Salticus*.

The scene is laid on the side of a corn crib, in the direct rays of the hot sun. Here the flies congregate, making a "happy hunting ground" for the fortunate spider. The weather boarding was very rough where the saw had cut across the grain which made a partial ambush. The color was light grey, corresponding almost perfectly with the color of the spider. The unsuspecting fly would alight near, when with a sudden leap, the tragedy would end. I watched this spider for a long time, whenever I turned my eyes away, it was several minutes before I could locate him again. At last I tried a trick with him. I caught a fly and pinned it close to the ambush. The spider began to creep and sidle up to the fly until within safe leaping distance, when he gave the final jump, and grasped the fly. Finding it fast he immediately released it and started as fast as his legs would carry him to the other end of the board. A disgusted and tricked spider. I have looked for him since on the same board but never has he been seen from that day to this. Did he die the victim of a practical joke?

W. B. HALL,
Wakeman, O.

A New and Interesting Fish for the Aquarium.

Translated from the German of Dr. Ludwig Staby in "*Natur and Haus*" by ANGUS GAINES.

The aquarium is rapidly growing in popularity and as the number of aquaria increases the number and variety of animals kept in them grow larger and larger.

Not so very long ago almost the only animals kept in aquaria were goldfishes, but now the goldfishes are being crowded more and more into the background by new acquisitions.

In cities various societies have done much toward making aquaria popular. One of the most active of these societies is the "Triton," of Berlin, which has introduced

many new animals for the aquarium.

In April of the last year there arrived in Berlin a consignment of South American fishes which had been captured and imported by one of the members of this society. Most of the fishes were submitted to the care of Paul Matte, the experienced pisciculturist of Lankwitz near Berlin. Among them was one species which can be recommended as a most desirable acquisition for aquarianists.

This is the *Chanchito* of the Brazilians, a fish about 5 cm. broad and 12 cm. long. It belongs to the genus *Chromides* and to the family *Heros*, but whether it is the *Heros facetus* or some closely allied species has not yet been fully determined. The Chanchito which is distributed throughout the ponds, lakes and rivers about Buenos Ayres has an attractive and beautiful color, but it is impossible to say precisely what this color is, for the fish possesses in a remarkable degree the power of changing its hue.

Usually it is brazen yellow with perhaps a greenish tinge, and has numerous black vertical bands and black fins, yet the same fish can suddenly turn perfectly white so that even the vertical bands will scarcely show, or it may display a deep black median line or several black spots and at the same time its fins may become clear and transparent, ornamented, occasionally with a dark or reddish border. Even the eyes change color. Usually yellow they may under excitment become blood red, to change after a time to a very dark hue. In short these changes of color are so numerous and so varied that the name "Chameleon fish" has, not inaptly, been proposed for the Chanchito in place of his South American name, which signifies "a pig" and was probably given to him on account of his short clumsy figure.

The sexes are not distinguishable externally.

The Chanchito should be kept in water at from 10 to 20 degrees, Reaumur, and fed on earth worms and small living animals of all kinds and minced meat.

Their manners are as curious and interesting as their color changes. During the spawning season the male and female stay close together and circle around each other in beautiful, graceful curves, their fins outspread and their gorgeous hues constantly changing.

At length they choose a shaded corner of the aquarium and after they have cleared it of all loose sticks and dirt the female, by means of an ovipositer 5 mm. in length, attaches her eggs to the wall, and these are immediately fertilized by the male. Both fishes then remain close to the nest and guard it carefully. After about four days the young appear, though they remain in their corner for two weeks or more until the yoke is absorbed.

The parent fishes are remarkably assiduous in the care of their young. Even when they are preparing for the second brood, which occurs in about eight weeks, they still keep a tender watch over the half grown fry. Anything that approaches their nest corner is at once attacked and, as I myself have observed at Matte's basin, they will even spring out of the water in their efforts to strike at a finger held near the surface.

It is a beautiful sight to see the troop of little fishes swimming about before the old ones and obeying every gesture of their parents.

Herr Matte succeeded in raising two broods of these interesting fishes last summer. The young were fed on *Daphniae*.

America's First Newspaper.

In answer to the query, What was the first newspaper published in America the *Writer* says:

A copy of the first newspaper ever published in America was found by Rev. J. P. Felt, the historian of Salem, in the Colonial State Paper Office in London, where he was looking for material for his history. Till then it was believed that the *Boston News-Letter* was the original American newspaper.

The paper found by Mr. Felt was published by Benjamin Harris at the London Coffee House in Boston, and was printed for him by Richard Pierce, Thursday, September 25, 1690—fourteen years before the *Boston News-Letter* was issued by John Campbell.

It is headed *Publick Occurrences*, and it is printed on three pages of a folded sheet, one page being left blank. There are two columns to a page, and each page measures about 7x11 inches.

The paper was intended to be a monthly journal, but in the first issue the editor published some news about local and military matters that led to its suppression by the authorities.

The Capture of a Golden Eagle.

It was a gloomy looking morning of last month that I arose early, expecting to visit a neighboring river in pursuit of black bass, but as dark clouds warned me of an approaching shower, I was rather uncertain whether or not to attempt it. Nevertheless I had my horse saddled, and taking with me my little brother, I started towards the river. I had scarcely ridden a mile when the first drops of rain began falling, and rather discouraged I turned my horse's head towards home.

As I approached a small body of woods that border a low meadow my attention was attracted by a large bird which sat rather unconcernedly in an oak tree a few yards distant. At a glance I thought it to be a large specimen of *Cathartes aura* but in this I was happily mistaken. The large bird was none other than *Aquilla chrysætos!*

Telling my brother to ride home for my gun, I cautiously crept behind a fallen log and approached the great bird within 40 yards. The Eagle doubtless saw me, but did not seem to show any uneasiness whatever. There I lay, almost afraid to breath, expecting every minute to see him lift his great wings and sail silently away, but in this I was again mistaken. In the distance I could hear the loud clattering of horse's hoofs, and a few minutes later my brother appeared on the scene, bringing with him my trusty Parker. But the cartridges! Looking in my hunting bag I was much disappointed to find that the largest shot it contained was *No 9*. Slipping two shells in my gun, I again crept behind the log, and approached the Eagle again within 40 yards. He had not moved and was in the same position as before. Taking deliberate aim I fired and down came the monarch, not dead, but winged! I rushed towards the bird, but was soon forced to retreat, as he showed fight, and I was not anxious to become a victim of his sharp claws.

After a great deal of trouble I succeeded in carrying the bird home alive. He was nicely mounted by F. F. Howe, of Clyde, N.Y., and now stands guard on my egg cabinet. This is the first occurence of this bird in our county (Campbell).

J. W. Daniels, Jr.,
Lynchburg, Va.

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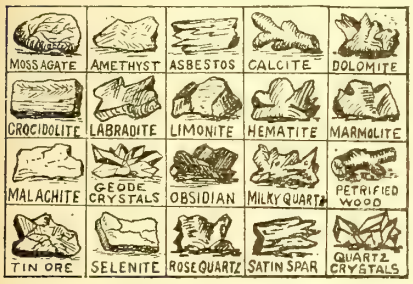

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Dear Sir:—The Process of Embalming which I bought of you two years ago is a grand success, and I am more than pleased with it. Birds that I mounted by it are perfection.
Leon F. Grant.
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Normal School, Ypsilanti, Mich., Oct. 13, 1886.
Have found your Embalming Process a success. Am satisfied. F. A. Norton.

Crystal Springs, Kansas, June 6, 1886.
Your Process works well. I am thoroughly satisfied. Many points in your method are superior to all others. L. B. Hartzell.

Albany, N. Y., Oct. 16, 1886.
Dear Sir:—I have mounted birds for over thirty years, but have never known simplicity and the perfect arrangement of the legs and wings until I purchased and tried your Method. My boy, whom I have been teaching the old style of stuffing for over two years and without success, succeeded admirably with your process the first attempt. I am delighted with it.
B. J. Hinchman.

Medina, O., Aug. 7, 1887.
Dear Sir:—Your Process has proven a success in every way. E. W. Martin.

Dear Sir:—The Process is a great success and gives me much pleasure. My little girl can mount birds in a life-like manner after two weeks practice, much to her delight. She is eleven years old. My boy of fourteen succeeded at the first attempt. Your method of shaping the body and wings is superior to all others.
Sept. 13, 1887. Mrs. H. B. Johnson

Coatsville, Penna., April 22, 1888.
Dear Sir:—Yours of the 13th inst at hand and in reply I would say that the Compound is O. K. and has done more for me than you claim it will do. I do all of my custom taxidermy work by your process. The first two objects that I attempted were a Wood Duck and a Raccoon. It is now over three months and they are as natural as life. Yours Truly, Wm. D. Doane.

June 13, 1889.
Dr. M. Gibbs.
Dear Sir:—I now fully understand your Process of Embalming, and can honestly pronounce it a success in every way. My first trial was satisfactory. The process is easily learned, and specimens can be mounted by your way in one-fourth the time required by the old method of stuffing; the specimens retaining their form much better also. Yours truly.
E. E. Shailer, Tylerville, Conn.

Allegan Mich., April 27, 1888.
Dear Sir:—The instructions and Embalming Process received. My son is making rapid progress for one so young. Is filling the house with mounted specimens. D. F. Stuck, M. D.

May 19, 1888.
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Baltimore, Md., March 24, 1895.
Dr. M. Gibbs.
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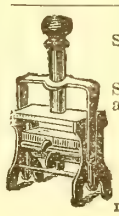

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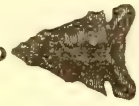

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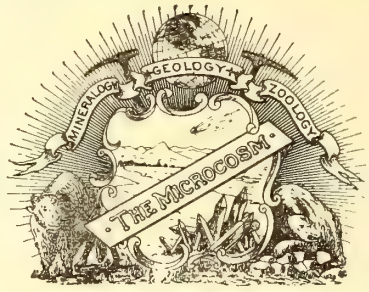

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Lockport		8:05	10:05	12.22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffa'o.....		8:55	10:55	1:25	5:15	8:45	

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QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

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Natural Science News.

VOL. I ALBION, N. Y., JUNE 8, 1895. No. 19

Natural Science News.

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The Greenland Scientific Expedition of 1895.

Efforts are now making to raise a fund of $12,000 for the purpose of bringing Mr. Peary and his two assistants home from Northwest Greenland early next fall, and, in connection with this, to prosecute scientific investigations during the available summer season. It is hoped by this means to charter and fit out a staunch steamer built for Arctic service and commanded by experienced Arctic navigators, which shall start from St. John's, Newfoundland, on or about July 5, 1895, for Inglefield Gulf, Northwest Greenland, latitude 78 degrees N., Mr. Peary's headquarters. The co-operation of museums, scientific and educational institutions and individuals is invited, not only because they will thus assist in the return of Mr. Peary and in the preservation of the results of his extended labors, but also because such an expedition will afford the most favorable advantages to eight or ten specialists for obtaining the rich results that are possible in a prolific field that, for a generation to come, may not again be easily and economically accessible

Mr. Peary, who has done great service in opening this interesting region to scientific study, will render every aid in his power to the expedition. His thorough knowledge of the natives, of methods of travel and work, and of points of interest. will greatly facilitate the present undertaking; and conspicuous among its results will be the fact that it will bring back, not only the fruits of its own labors, but also the product and records of the able and brilliant explorer who, for several years, has devoted all his time, energy and money to the study of Arctic life and phenomena, and to widening the bounds of geographic knowledge in the North Polar area.

The American Geographical Society contributes $1,000 toward the expenses of such expedition, provided that other subscriptions, sufficient to make up the sum required to send the expedition, are obtained.

A limited number of scientific societies, educational institutions, or individuals, contributing $1,000 to the fund, will be entitled to have each a representative on the expedition, who shall be approved by the scientific leader. The expenses of each member over and above $1,000 will be the cost of his scientific outfit, transportation from his home to St. John's, and from New York or Philadelphia to his home. The proposed work will require three months. Further information can be had from Emil Diebitsch, 2014 Twelfth St.. N. W., Washington, D.C.—*Scientific American.*

A Week on Walden's Ridge.

In the June *Atlantic* Bradford Torrey concludes A Week on Walden's Ridge. His descriptions of nature are, as usual, vivid and delightful. He says:—

In the woods, nevertheless, I stopped long enough to enjoy the music of a master cardinal,—a bewitching song, and, as I thought, original: *birdy, birdy,* repeated about ten times in the sweetest of whistles, and then a sudden descent in the pitch, and the same syllables over again. At that instant, a Carolina wren, as if stirred to rivalry, sprang into a bush and began whistling *cherry, cherry, cherry,* at his loudest and prettiest. It was a royal duet. The cardinal was in magnificent plumage, and a scarlet tanager near by was equally handsome. If the tanager could whistle like the cardinal, our New England woods would have a bird to brag of.

Not far beyond these wayside musicians I came upon a boy sitting beside a wood-pile, with his saw lying on the ground. "It is easier to sit down than to saw wood, isn't it? said I. Possibly he was unused to such aphoristic modes of speech. He took time to consider. Then he smiled. and said, "Yes, sir." The answer was all sufficient. We spoke from experience, both of us; and between men who *know*, whatever the matter in hand, disagreement is impossible and amplification needless.

Three days later—my last day on the Ridge—I had better luck at the swamp. The stranger was singing on the nearer edge, as I approached, and I had simply to draw near and look at him,—a Louisiana water-thrush. He sang, and I listened; and farther along, at the little bridge where I had first heard the song, another like him was in tune. The strain, as warbler songs go ("water-thrushes" being not thrushes, but warblers), is rather striking,—clear, pretty loud, of about ten notes, the first pair of which are longest and best. I speak of what I heard, and give, of course, my own impression. Audubon pronounces the notes "as powerful and mellow, and at times as varied," as those of the nightingale, and Wilson waxes almost equally enthusiastic in his praise of the "exquisitely sweet and expressive voice." Here, as in Florida, I was interested to perceive how instantly the bird's appearance and carriage distinguished it from its Northern relative, although the descriptions of the two species, as given in books, sound confusingly alike. It is matter for thankfulness, perhaps, that language is not yet so all-expressive as to render individual eyesight superfluous.

I kept on the Brow, and some time afterward was at Mabbitt's Spring, quenching my thirst with a draught of liquid iron rust, when a third songster of the same kind struck up his tune. The spring, spurting out of the rock in a slender jet, is beside the same stream—Little Falling Water—that makes through the swamp; and along its banks, it appeared, the water-thrushes were at home. I was glad to have heard the famous singer, but my satisfaction was not without alloy. Walden, after all, had failed to show me a new bird, though it had given me a new song.

Producing Pearls.

Peeling pearls is a little trick which Parisian jewellers have reduced to a science. They will take a pearl which is apparently so imperfect that it is scarcely marketable, and with a skill bordering on the marvelous, will peel off the outer layer and develop a lovely gem.

A pearl is made up of layers of "nacre" and animal tissue. The nacre is that beautiful iridescent substance which gives to mother of pearl and the lining of sea shells their chief beauty, and it is especially attractive in the pearl oyster. The layers of nacre and animal tissue alternate, so that the skilled jeweller can peel an ugly, discolored pearl and make of it quite another jewel. The tools employed are a sharp knife, extremely delicate files, soft leather and pearl powder. The layer of nacre is hard and difficult to cut, but the pearl renovator chips it off bit by bit, feeling his way with the edge of his knife, for the layer is too thin to be seen by the unaided eye.

In one of the workshops of Chicago is a man who is specially devoted to pearls. He claims that a perfect pearl is the most beautiful of gems and says that the time is coming when pearls will be fashionable again. He exhibits with some pride a large pink pearl and said that it had been artificially started. This brought out the fact that in China and Japan pearl oysters are not only cultivated, but are forced to produce pearls.

A pearl is the result of an oyster's efforts to remove a source of irritation. If a grain of sand or some other hard substance finds its way into the shell the oyster begins coating it with nacre, which gives the irritating intruder a smooth exterior. The oyster deposits nacre over the offending object as long as it remains a source of irritation, and the Chinese have taken advantage of this peculiarity of the solitary mollusk. They make little pellets of earth which have been dried and powered with the juice of camphor seeds, and during May and June plant these in the oyster. The shell is opened with a mother-of-pearl knife, care being taken not to injure the oyster, and the earth pills are laid under the oyster's beard. The treated mollusks are then placed in canals and pools and left undisturbed until November, when they are dredged up, opened, and the nacre-covered pellets removed with sharp knives. The pellets are usually found fastened tightly to the inner surface of the shells.

The Chinese pearl farmer then turns jeweler. He drills a little hole into the pearl at the place where it was fastened to the shell and removes the dirt. The cavity is filled with yellow rosin, and the opening sealed neatly with a tiny bit of mother of pearl.

But a Frenchman has improved on this method. He found that the Chinese killed many oysters by forcing the shell open to deposit the earth pellets. The ingenious Frenchman bored holes in the shells of pearl oysters with a small drill and then introduced through the opening little globules of glass. He plugged the holes with corks and left the oysters alone to manufacture pearls. In six months the glass nuclus was covered with a pearly deposit, and the Frenchman reaped a beautiful harvest of pearls. He did not have to bore holes in the pearls to remove the centre, and his product brought higher prices than the pearls made by the Chinese.

These artifical pearls have much of the lustre and beauty of the real gems, but are sold at a much lower rate by honest jewellers. Experts can color pearls black, pink, gray, and other colors by the use of chemicals. For instance, a pearl put in nitrate of silver turns black. But pearl raisers know a trick worth two of that. Certain kinds of fresh water mussels bear pink pearls, and pearl oysters produce different colored pearls, according to the part of the oyster which is irritated by the foreign substance. The artifical pearl producer knows this and plants his seed accordingly. In Washington is an artificial pink pearl as large as a pigeon's egg, and its heart is a bit of beeswax.

Perfectly round pearls which weigh over twenty-five grains each are scarce and command large prices, but such pearls are natural. Artifical pearls are usually flat on one side.—*The Mineral Collector.*

Field Columbian Museum.

Yesterday was the first anniversary of the opening of the Field Columbian Museum. The day was marked by an attendance of 4,500 visitors. The attendance during the year was 451,088 and the expectation of the trustees and Director Skiff that it would reach nearly half a million was realized. The number of paid admissions. was 34,840.

The average daily attendance, counting free and pay days, was 1,243 and the average daily attendance on pay days was 134. The largest number of visitors on any one day was 15,835, on June 3, 1894, the day after the opening. The smallest attendance was on Feb. 7, 1895, the day of the severest blizzard of the winter. Into the big building only six persons came that day and all were women.

Since the opening of the Museum many accessions have been made to it. The most important in the anthropological line was the contents of the Hopewell mound in Ohio. The Allison V. Armour expedition to Yucatan brought to the Museum material from the ruins in Yucatan. About two weeks ago the government of Nicaragua presented a collection of material from that country. Departments of microscopy, photography and printing have recently been opened. An Egyptological division, occupying one hall and two alcoves, has been made in the anthropological department.

The Museum has started the publication of scientific works, and there are four now in press. The first one out will probably be "The Authentic Letters of Columbus," by William E. Curtis, an honorary curator.

The landscape on the north and south sides of the Museum has assumed a new appearance. All the trees have been removed and the avenues leading to the entrances are entirely devoid of shade. When the sun was hottest yesterday afternoon visitors walked along the side of the building to be in shade and a park policeman stood in the shadow of the Cæsar monument.—*Chicago Record, June 3d.*

CLEANING SHELLS:—A correspondent in an old copy of *Random Notes* writes: "I have lately tried an experiment in cleaning shells. I boiled some cones and a few others for three or four minutes in a strong solution of potash, and the epidermis came to pieces and fell off, leaving the shell clean and smooth, with no evil effect at all. Three or four ounces of Babbitt's potash to a pint of water is about the proper strength. (The mixture may be saved and used many times.) Scrub the shell with a stiff brush, and when it is dry rub with a cloth very slightly oiled, to obtain a fine gloss."

Imbeciles Among Plants and Animals.

Every one understands what is meant by the imbecile, when speaking of human beings. The mental development of the child is checked, and even when such a child reaches the age of manhood, it is still but a child in its feelings and wants; but it is not alone among human beings that the characteristics of imbecility are found. In almost all trees, the characteristics of the foliage or the habit are very different during the first few months of existence than they are in after life. There is a matured characteristic as well as an infantile one. The Tulip Tree for instance has its first set of leaves entire, without any appearance of the lobe or the truncate termination which it assumes in old age; but sometimes these juvenile characteristics will be maintained through life,—and then we have what is known as the *Liriodendron integrifolia*,—that is to say the Entire-leaved Tulip Tree. This is more particularly marked among evergreens. During the first year of the arbor-vitæ, pinus, cupressus, retinospora and similar plants, the leaves are heath-like, that is extending from the stem quite separate and distinct; but occasionally there are individuals carrying these characteristics through life; and many of the so-called Japanese species are merely vegetable imbeciles.

It is not uncommon for acute observers to find branches assume their adult form in many individuals in this imbecile class. Just as in the case of human beings there are occasionally instances where imbeciles assume matured characteristics. This is also true of the animal world. A friend of the writer has an aquarium in which tad-poles as well as other aquatic creatures are raised. As every one who is acquainted with the commonest events in natural history is aware, the tad-pole during its first season throws off its tail, pushes its legs and becomes a frog. In the case of the friend referred to, he has a tad-pole which thrust out its legs and then ceased to develop further. After three years it is still a tad-pole with its two frog legs, retaining its tail and in all other respects it is a tad-pole with the tad-pole characteristic intact. It may be termed a froggy imbecile.—*Mechans' Monthly for June.*

Exfoliation of the Tortoise.

I read an article in the Natural Science News, some time past on the exfoliation of the tortoise, and imagine my surprise on finding one while riding through the woods on May 2d. All the leaves were off the back and down one side leaving the outer row intact, excepting one plate was gone, just above the right hind leg. At first it looks like bone or dead shell, but in the course of a few days it begins to look sleek, and a dark spot appears and spreads until now the dorsal plates are almost black. I removed one fragment which was loose and enclose it. The bone has not begun to change yet, but one removed ten days has become sleek. All the remaining scales are loose, and the process of desquamation is in full force. I write to say that if any one you know wishes to have it and watch the process, or take notes and data, I will box and ship provided they pay expressage. I am away from home most of my time and cannot do it.

I. P. Canfield, D. D. S.,
Paw Paw, W. Va.

Keokuk Geology.

Keokuk, Iowa has a geological record that in some respects is quite unique. 12 miles north of the city, the great Father of Waters begins a headlong descent of 24¾ feet in that distance, known as the Des Moines Rapids, which caused such serious interruption to navigation, that the government thought it advisable to construct a canal to obviate the difficulty. The rock is limestone, of a very hard and durable nature. Some of it actually passing the border line into marble.

Like other Palæozoic rocks, these strata had their birth in an open sea. And they are mainly formed of the remains of animal life, every one of the five sub-kingdoms of which, is represented in these rock strata that underlie the city. Protozoa are not largely represented by fossil remains. Two species of sponge are known. But of Radiates there is a better showing; for *Zaphrentes* is a rather common coral, and Crinoid remains in the way of detached broken arms and stems are plenty. The perfect fossil is not easily obtained, but sometimes many species are found crowded together in a small space, so that from an area of ten feet square, 200 have been procured, seeming to show either a gregarious habit in the animal, or a retreat into protected places for safety, or a more congenial place of growth because of currents then existing, or in the amount of food wafted to these favored localities.

The following genera are most largely represented viz: *Actinocrinus*, *Forbesiocrinus*, *Cyathocrinus*, *Platycrinus* and *Agariocrinus*.

The Molluscan remains are well represented by Brachiopods, of which the genus *Spirifer* is, perhaps most abundant, yielding seven or eight species. Also *Orthis* is quite abundant. The Gasterpods make a poor showing.

Of Vertebrates there are the remains of many Selacian, or Cartilage fish, in the way of teeth and fin spines. So that taking the number of these found in this locality, seems rather to add another doubt whether the Sub-Carboniferous is not really better entitled to be called the "Age of Fish" than the Devonian, as that has usually been styled.

The upper beds of the Keokuk formation properly are famed for their Geodes. I think a true explanation of how these have been formed is yet wanting. It is easy enough to call them "*Genus Biopella*," but how formed this interior lining of crystals of quartz or calcite or both, as the case may be, sometimes almost to the obliteration of the internal space. The Geode sometimes contains liquid, but if all had originally been filled with the most concentrated solution of silica or lime carbonate, it would, by evaporation, be entirely insufficient in quantity, to yield the interior lining of crystals. After the crust of the geode was formed, being very generally impervious to water, no solution holding material could find its way inside. Besides, when at home in their native bed, the matrix rock is a rather soft magnesia limestone, from which the desired material for the included crystals, we would rather suspect to be Dolomite or Calcite and not Quartz, which is most common. When the matrix rock in this vicinity approaches to a purer limestone in constitution, the geode seems to vanish—cavities in the rocks, often beautifully lined with crystals, taking its place, but the exterior shell is obliterated. It has adhered to, and become a part of the surrounding rock, and is not separable from it and the cavity very often is not

round. It is like the unripe nut inseparable from its hull. In fact the resemblance of the nut and geode is rather striking, though the impassable gulf between the organic and inorganic intervenes. The crystals in the geode represent the meat in the nut even to its intricate foldings or globular, entirety—enclosed by a shell in each case. The matrix rock representing the hull. May there not have been a similar growth in the two cases. An expanding process, by which crystals, shell, and rock all grew and formed simultaneously and access to the interior never incomplete until the whole was finished out of the surrounding formative material; so that a proper relative size of crystal and shell was retained at every step.

But to the burden of our text. The overlying St. Louis formation is, in its lower part, magnesian limestone beds, overlaid by a heavy bed of pure limestone concretionary at its outcrops, yielding the fine *Lithostrotion* Coral and often *Archemides*.

The lower coal seam lies uncomformably on this; but it is of no economical value, being only a few inches thick. Over this comes a layer of sand rock, yielding the usual coal flora of Calamites, Lepidodendron, Sigillaria, Stigmaria, &c, and above all is a heavy coat of drift, where it has not been removed by denudation, capped by our usual surface soil.

GEO. M. CROFTS,
Summitville, Iowa.

Collecting and Preserving Seaweeds.

A very important question this, which in answering I must preface by the advice, to collect as little at a time as you can afford, according to your stay in any locality, and collect them either in an oilskin bag or a tin can with sea water; for these flowers of the sea fade, and even decompose marvellously fast, when roughly handled or carelessly gathered.

The best time for collecting is in the early morning, when, on your return, there is leisure for immediately laying them out. If you come home over-tired, and leave them until next day, the chances are that one-half of them are spoilt. I need not repeat that the finest and rarest specimens are found in the lowest-tide pools, or cast up after a storm; but even at high tide the seaside naturalist will find most pleasant occupation and delightful surprise if with a microscope he investigates those very small specimens which are too insignificant for the lady's album, and finds such form and colour, provision and harmony, as the Almighty Creator conceals from the unseeing eye, to reveal to our patient and intelligent research.

Supposing, however, that we have searched a few tide-pools, and brought home a tangled mass of olive, red, and green seaweeds, we get some soup plates, fresh water, a bit of alum, some camel-hair pencils, and I use needles, mounted on lucifer matches, to assist in disentangling the mass.

Of course we are provided with paper cut into large and small squares; and as much of the beauty of the specimens depends on the quality of the paper, it should be fine, and at the same time stout, almost as good as drawing paper.

Now float a piece of weed in fresh water; if very dirty or sandy, wash it first, and in renewed water float it on a piece of paper supported by your left hand, whilst with your right hand you arrange the plant in a natural manner, using a mounted needle or porcupine-quill, and thinning out the superabundant branches with a fine pointed pair of scissors. When the specimen is placed as you like it, cautiously raise the paper that the position of the plant be not altered, and let it rest somewhere with sloping inclination, that the moisture may run off whilst other specimens are treated in the same way.

Do not leave them long thus, for they must be pressed before the paper is dry.

A convenient travelling press consists of two pieces of deal board about two feet long and one foot wide; a couple of quires of whity-brown paper, and a double strap, such as we use for railway wrappers. Lay blotting paper between the coarser paper, and you can strap them closely, and carry your seaweed very safely in your hand.

In drying them you must have old linen or fine muslin, old and soft, to lay upon the weed and prevent its sticking to the upper paper; but do not leave it beyond a day or so, lest it leave chequered marks upon the surface of the weed, especially those with broad fronds, like *Delesseria*.

Experience will give the best lessons. Some seaweeds, such as *Melogloia*, which are glutinous, must not be pressed at all, but laid out to dry, and when perfectly so, then moisten the *under* side of the paper, and give a gentle pressure only.

Others will not adhere to paper, and therefore, when dry, brush them over with a little isinglass dissolved in gin (laid on warm), and they will then be fixed closely to the cardboard or paper.

Another preparation is: one ounce oil of turpentine, in which some gum mastic the size of a nutmeg has been dissolved. This gives a gloss to the specimen and helps to preserve the colour.

You must change the blotting paper and muslin at least twice during the process of drying larger seaweeds; the smaller ones will be ready in a couple of days for the album, on the second day giving heavy pressure by stones and weights besides the strap.—*From Clarke's Common Seaweeds.*

Home Made Mucilage.

A very convenient mucilage can be made out of onion juice by any one who wishes to use it. A good-sized Spanish onion, after being boiled for a short time, will yield, on being pressed, quite a large quantity of very adhesive fluid. This is used extensively in various trades for pasting paper onto tin, or zinc, or even glass, and the tenacity with which it holds would surprise any one on making the first attempt. It is a cheap and good mucilage, and answers as well as the more costly cements.—*Invention.*

The Last Word.

"The ostrich is a queer bird," said Mr. Blykins. "There's no excuse for its behaving in the way it does. When it sees an enemy coming, it sticks its head into the sand instead of running."

"That's its nature," replied his wife.

"I know it, but just the same it isn't logical."

"Oh, yes, it is, dear."

"How do you make it out."

"It's ornithological."—*Washington Star.*

Among other good things procured by Messrs Ridgeway, Palmer and Brown in their recent Florida trip, Mr. Brown collected a number of Carolina Paroquets.

Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

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20 showy specimens (like cut, but larger).
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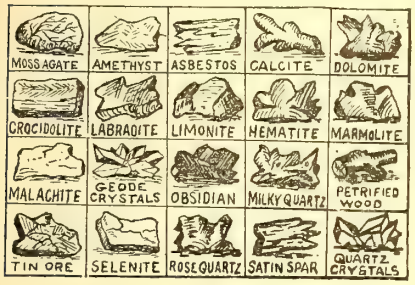

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Rutilated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

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Occasionally, the following can be sent out in extra specimens: **Beryls, Columbite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Octahedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address.

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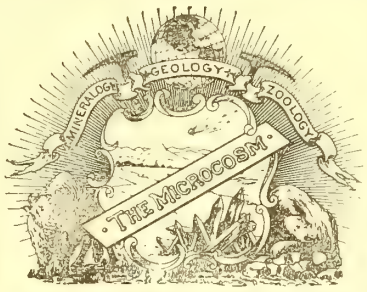

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The Young Naturalist's

This is truly one of the most "*Marvelous*" collections of curiosities ever put up for the money. The specimens at retail amount to over $2.50. I shall offer the entire collection, each specimen labelled and wrapped separately. The entire lot securely packed in a wooden box and sent PREPAID for ONLY 75 cents. Safe delivery and satisfaction *guaranteed.* (This collection was originally intended for a $1.00 one and should not be confounded with my old 65c collection by the same name.)

Contents of the Marvelous Collection:

Card of Marine Algæa, Mass
15 Foreign Stamps.
Sand Dollar, Mass.
Chinese Coin.
Tusk Shell, "Wampum," W. I.
Organpipe Coral, Singapore.
Red, Yellow and Brown-banded Sea Beans, one each, Bah.
Branch Coral, *Pocilipora,* E. I.
Spearhead or Arrowhead, Rowan Co., N. C.
Rose Coral, Bahamas.
Money Cowry, Ceylon.
Pink Coral, Caroline Isles.
Alligator Tooth, Fla.
Vermetus (worm) Shell, Bah.
Sand Shark or Skate Egg, Atlantic
Limpet, *Fissurella,* W. I.
Bloody-tooth Shell, Nassau.
Inflated Olive Shell, E. I.
Egg Capsules of Periwinkle, Atlantic.
Piece of Tapa Cloth, made from the bark of the Paper Mulberry by the natives of Samoan Isles.
Chinese Horn Nut.
Yellow Coral, Hawaii.
Campaign Badge.
Satin Spar, Eng.
Peanut or Rope Shell, W. I.
Gum Pine, N. C.
Dove Shell, *Columbella,* Jamaica, from exhibit at World's Fair.
Leaf from Japanese Book
Thorny-nosed Murex, Med. Sea.
Fossil, *Scaphites nodosus,* Montana.
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Fiddler Crab, Atlantic.
Egg of Red-winged Blackbird, Ills.,
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Copper-stained spec. of Calcite Stalatite, Arizona.
Valve of Radiated Scallop Shell, Atl'tic.
Branch Coral, *Madrepora,* W. I.
Sertularia, Atlantic.
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This collection will not only prove invaluable to "young collectors" but many older ones will appreciate its merits. It is especially adapted to Kindergarten work.

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Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only 50c. Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

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Ancient stone relics from Southern States Sale.

Arrow points 20, 35 and 50c per doz. Spearheads 10, 20, 35 and 50 cents, some 7 inches and more long. Grooved axes large 50c to $1.00 each. Celts, all sizes, 15 to 75c. Idols, perforated stone knives, charms and many other implements at reasonable prices. Perfectly transparent arrow points from 10 to 50c each. These are beautiful gems All these relics show a wide range of material and workmanship.

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For sale at a bargain, for cash, a collection of Modern Sioux Relics. Ghost Shirt, War Club, Moccasin, Bow and Quiver of Arrows, Knives, Scabbard and Whetstone. Fine Pipestone Pipe and ornamented Tobacco Pouch. Points, Bags, Whip, Bone Necklace, Waist Belts, &c. All collected at Pine Ridge and in first-class condition. E. H. HARN, Henry, Lincoln Co., N. C.

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The above sets, first-class, with full data, a few only of each species on hand; also 1-3 American Woodcock not quite first-class a 75c per egg.

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My little ad. in NATURAL SCIENCE NEWS has been a wonderful success. I had received replies and was bargaining before I knew it was published and since then letters are still coming in. ALEX H. NOEL, St. Louis, Mo. [Principal of Laclede School.—Ed.]

In the last seven years I have advertised my process of embalming in twenty-seven papers and magazines. For the number of replies and direct returns, your NATURAL SCIENCE NEWS advertisement eclipses all previous seasons. and discounts all other amateur local and general attempts. Respectfully Yours. MORRIS GIBBS, M. D., Kalamazoo, Mich.

NATURAL SCIENCE NEWS

VOL. I. No. 20. ALBION, N. Y., JUNE 15, 1895. Weekly, $1.00 a Year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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84 VARIETIES of 1st class eggs in sets and singles to exchange for sets with data. Enclose stamp for list. Lattin's Standard Catalogue basis of exchange. CARRINGTON C. BACON, Imboden, Lawrence Co., Ark. O

WILL EXCHANGE perfect specimens of "Catlinite" (Red Indian pipestone) or Minnesota Red or Pink Jasper for Sands, Soils from all sections, Shells, Curios, petrified specimens or what you have, correspondence solicited. F. E. CAPWELL, Pipestone, Minn.

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WANTED.—Employment in a Natural History Establishment for very reasonable compensation or would invest as a partner. References given. Correspondence solicited. State rent paid for store, &c. GEO. M. CROFTS, Summitville, Iowa.

EXCHANGE.—For every book, of any date sent me (no fiction) I will mail a collection of shells, star fish, &c. EVERETT T. OVERTON, 168 Atlantic St., Bridgeport, Conn.

ORNITHOLOGISTS and Oologists send your full name and address (printed if convenient.) For free insertion in "*Hughes' Annual List*." State if you have collection and desire exchanges. A copy, handsomely bound, sent postpaid to every paper, devoted to Natural History, copying this notice, and mailing me paper containing same before September 1st. WALTER H. HUGHES, Grand Rapids, Mich.

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WHAT AM I offered in first class bird skins, not smaller than Blue Jay, for cap and ball revolver in excellent condition? "Life of Audubon" (new) for Davies' Nests and Eggs. R. G. P., 57 Charlotte St., Charleston, S. C.

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EASTWARD.

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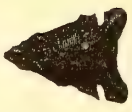

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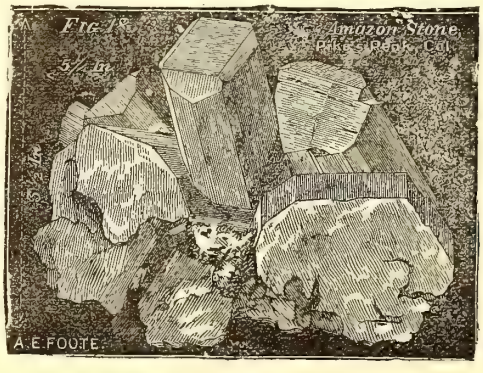

Recent Additions to Stock.

QUARTZ.—Dr. Foote recently purchased at Hot Springs, the great Lawrence collection of Quartzes, which attracted so much attention from visitors at the Centennial, where it was exhibited in the Arkansas building. This, together with a recent find in the Crystal Mts., has brought to us some of the finest specimens ever seen. Besides the clear crystals of the regular type, both in clusters and detached crystals, there are many rare and curious *Modifications, Inclusions, Penetrations, Flattened, Distorted and Bent forms. Inclusions of Pyrophylite, Chlorite, Manganese, and Albite* arranged along the lines of Quartz crystallization, forming the most beautiful "*phantoms.*" Crystals containing *moving bubbles*, etc., etc. By a personal visit to Magnet Cove (Ark.) were secured fine *Rutile Rosettes, Brookite* in brilliant crystals, *Vesuvianite, Dysanalyte* in gangue, *Lodestone, Monticellite, Leucite* (a new occurrence), *etc.*

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Natural Science News.

VOL. I ALBION, N. Y., JUNE 15, 1895. No. 20

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Our National Flower.

BY MORRIS GIBBS.

One of our most noticeable omissions in National matters lies in the fact that we have never yet adopted a flower as a representative of our country's purity, honor and individuality. This oversight means so little to the vast majority of our citizens, that the subject will appear ridiculous to the thoughtless. Nevertheless, there are thousands of enlightened foreign visitors to our land who will be shocked and wonder struck to learn that our Union, now over a century old, has, as yet, never adopted a National Flower.

There is but slight excuse for this neglect, and we can only offer as a reason, that we have been too busy in defending our patriotic eagle to find time to devote to the sentimentality of what may be termed womanish flowers. It is safe to assert, that the actual cause of neglect, lies in the fact of our being a mixed nation, and therefore, from the constant accessions from foreign countries, we have not had a sufficient period in which to form an all pervading sentiment.

A year or so before our 1876 centenial, the question of a national flower was discussed. At that time many prominent persons advanced their favorites and offered their reasons for adoption, but the discussion amounted to nothing, and the result was a failure to unite on a species. In several agitations since 1875, the matter has been brought before the public through the press, but uniformity has never been a result.

Many advocate the golden-rod as our floral emblem, and I am inclined to think that this pleasing autumnal species will eventually be the choice. However there are several reasons why this showy yellow flower should not be selected. Let us consider the points and merits of this and other flowers of America.

The scientific name of the golden-rod is *solidago*, a word meaning cure-all, in its general significance. It has been suggested by some, in a spirit of fun, that this species might with propriety be selected as our national representative, because of its name—*to make whole*. We are, as is generally known, blessed with the grandest aggregation of quacks of any country under the sun, and it does seem a fitting tribute to quackdom to emblazon cure-all on our escutcheon.

Although so named—a cure-all, the plants of the genus are now considered practically inert, as regards their medical properties. The pharmacopœia ascribes various effects to *solidago*. It says that golden-rod is aromatic, moderately stimulant, and a promotor of perspiration. The dried flowers and leaves are used as a pleasant and wholesome substitute for common tea. However, the herb is now but rarely used in medicine, and is at best, rather an old woman's remedy, than a doctor's reliance.

There are over forty described species and varieties of golden-rod in the United States, while there are undoubtedly many others yet to be described. Of these about thirty are to be found in the region of the Great Lakes. Professor Beal of the Agricultural College of Michigan, enumerates twenty-four distinct species in this region. Now it will be seen on the examination of a general collection of golden-rods, that there is a great amount of difference in the formation of the clusters of blossoms, and this variation is so manifest that to a botanist the various species may be readily identified. While to the vast majority of persons interested, nothing can be distinguished as to the kind. It does not seem desirable to select a heterogeneous, cure-all flowers, which cannot be properly defined as our national choice.

The shamrock, thistle, fleur-de-lis and others were known to all in the countries where they were selected as emblematic; but, here in America, there are millions who are much better acquainted with foreign species, than with our of-late-notorious golden-rod. Many of our American born citizens of refinement do not know this arbitrarily selected flower, even though it is of such general dispersion.

Aside from the fact that this flower cannot be considered suitable, by lovers of propriety—we still cannot help admiring it as very pleasing in its autumnal splendor. To those who admire our woods and fields, there is a charm, which is never displaced by the more brilliant display of the garden or conservatory. No one, who has passed the period of youthful roving in woods and fields can view a wild flower without recalling the past. Pleasant memories, resulting from some familiar sight or sound, are ever recurring to us, as we wander through the grove, or over the pasture lots, and the person who has no agreeable rememberance of youthful days, must be callous indeed, or at least, strangely constituted. No wonder that Campbell says in his comparison of wild flowers:

"Ye field flowers! The gardens eclipse you, 'tis true,
Yet wildings of nature I dote upon you,
For ye waft me to summers of old,
When the earth teemed around me with fairy delight,
And when daisies and buttercups gladdened my sight,
Like treasures of silver and gold."

In a careful review of all available matter on the subject of a National flower, I find sixteen species in nearly as many families, spoken of. Of this number several species are known to be aliens and of course need not be considered. The dandelion appears to be a favorite with many and I have no fault to find with it. However, it is probably too much of a pest to ever gain favor enough to entitle it to merited distinction.

Mr. Maurice Thompson of Crawfordsville, Indiana designates the tulip tree as his candidate for the honor. This tree is commonly known as the white-wood at the north, while in various other sections it is known as poplar or popple, tulip tree—in allusion to the

shape of its peculiar flowers, and also, but improperly, as sycamore. Mr. Thompson gives excellent reasons why this species should be selected; among others, that it is of a strictly American genus, and belonging to the distinguished magnolia family. Besides which, it is beneficial in several ways, and is found growing both at the north and south and of quite general dispersion. The flowers of the whitewood appear late in spring. They are large, cup-shaped and are agreeable to behold, and stately, as might be supposed from their parent tree. The blossoms are of a yellowish color, tinged with green and orange.

Without entering into a detailed account of the suggestions offered as to our National flower, with a full list of favorites enrolled by various persons, we will nominate a modest little flower. Reference is made to the wind flower, or anemone, as it is commonly called.

Swayed by happy May-day breeze
Within the woodland bright;
Beneath the grand old forest trees
In gossamer of white;
Waving, nodding, fair and free;
Charming, sweet anemone.

By the brook-side growing fair
With dew thy chalice wet.
Snowy cup of beauty rare
Who can thee forget?
Trembling, tossing, wild and free;
Unadorned anemone.

The trillium of changing hue
Bends over thee, above,
The gentle violet so true
Exhales its fragrant love.
Shaking wav'ring merrily,
Spotless, pure anemone.

Not one of all the garden flowers
Can ever claim with me
The mem'ry of those happy hours
I've passed in spring with thee.
Blushing in thy modesty
Delicate anemone.

I wish that space would permit of a partial description of this charming, delicate creation. But then, who is there who has strolled in the woods and pastures in the month of May, and has not met with the anemones, wake-robin, spring-beauty, adders tongue and a dozen others. My readers must acknowledge that our choice of a National flower must come from the early spring blossoms, for it is to these that our affections chiefly tend, while we consistently ignore the later, but more showy flowers of summer.

The Biggest Goose.

I heard the other day an amusing tale of a certain well-known English nobleman, who had imported two emus with the hope of breeding from them, and on leaving his estate for town left also strict injunctions that the greatest care should be taken of the lady emu, if she produced the desired egg or eggs. The egg arrived in due course, but as artists have found before now, the lady declined to "sit." The steward however, was an ingenious man, and thought of a substitute, but his powers of composition were by no means on a par with his inventiveness, and he announced the interesting event to his master in the following terms:

"The emu has laid an egg, but we were in a great difficulty, as she would not sit on it. I did what I thought was best, and in your lordship's absence I have placed the egg under the biggest goose on the estate."—*Pall Mall Gazette.*

"Substantial" Material for a Nest.

A $10 bill, which had mysteriously disappeared, was recovered by Assistant Coin Teller Phil Turpin of the sub-treasury in a peculiar manner. He has a beautiful farm out on Cliff creek, near the Little Miami river. In that section birds fairly abound. One evening Mr. Turpin was getting ready to attend a soiree at his next neighbor's in Newtown, about two miles distant. The weather was unusually warm, and he left the windows of his room open, says the *Cincinnati Enquirer*.

Mr. Turpin had taken his money, among which was a $10 bill, and laid it on a center table, intending to put it in a pocket of his other trousers. The room is at the corner of the house, and has windows on both sides.

He stationed himself at one of the windows and commenced to shave. The birds were singing outside and flying about the house and through the open windows, while others were busy in trees building nests. It was luxury to shave amid such surroundings, and when Mr. Turpin finished he looked sleeker than ever. After washing he prepared to don his Sunday-go-to-meeting clothes. After he arranged his necktie to give the best effect he went to the center table and began picking up his money, but was not a little surprised to find a $10 bill missing. He thought that the wind might have blown it on the floor, and he began looking there for it.

After a long time spent in vain he gave up the search there. He then went out into the yard and began hunting among the flowers and grass for it, thinking that it might have been blown through the open window, but had to go to that soiree minus a $10 note.

Day before yesterday the severe windstorm blew a robin's nest out of a tree near the front porch. Mr. Turpin picked the nest up and was about to cast it away, when he noticed what seemed to be a piece of paper of peculiar color. He examined it, and found it to be currency of some denomination, but it was not until he had carefully torn the nest apart that he discovered it to be a $10 bill. It was apparently the one he had lost a couple of weeks ago, a bird having flown into the room and snatched up the money. The bill was in pretty bad condition, and he redeemed it at the treasury.

To All Michigan Observers.

BULLETIN.

In a previous Bulletin suggestions were offered to Michigan Observers relative to the taking of notes on our birds. Present returns indicate that good results are to be the outcome of our combined efforts, and that the final compilation of these observations will bring forth many new facts.

Our State is fortunate in possessing many observers of birds, but there are other branches of scientific interest which should also command our attention and it is indeed unfortunate that but slight incentive has been offered to our collectors toward forming collections and studying these interesting branches.

Among the various divisions of animal life are the Classes Batrachia and Reptilia; and with the exception of a very few collectors among us, comparatively nothing is known regarding these interesting animals.

It is within the province of the Michigan Academy to study all branches of science, and it is hoped and expected that the obaervers in animated Nature will so divide their forces as to thoroughly cover the ground, and gain for Michigan an equality with Sister States. It may be said that the true naturalist is not one who is confined to a single branch of study; for though a specialty may be followed, still an observer of merit will find much to interest him in other departments besides that of his or her selected pursuit.

The following suggestions are offered to Michigan Observers with the hope that many new facts will be brought to light regarding Reptiles and Batrachians. There are known to be twenty-one spe-

cies and varieties of Serpents in Michigan; only one Lizard is known, while eleven or twelve Turtles are recorded. Indiana greatly exceeds us in the wealth of her Reptilian fauna, which is to be expected, as that state embraces several Southern species. There are several species in Northern Indiana, which are as yet not recorded from Michigan, and all specimens should be saved which are taken on our Southern boundary. The distribution of our species is also a subject of interest, and as yet but little studied; and notes and specimens from all quarters of our territory are desired.

But it is among the Amphibious creatures that we are principally lacking in our knowledge, and in the order *Urodela* * (tailed batrachians) where we are most at fault. There are eight species and varieties of these interesting animals in this order known to us in the Peninsular State, several of which are very rare, and the distribution of all, with but one exception, is little understood. We may expect to find two to eight other species here.

The range and abundance, or scarcity of several species of our frogs are but little known also, and valuable information may be gathered regarding them. In truth, no note, *properly identified*, on any reptile, or for the matter of that, on any point in our Sciences can fail to be of value, and may prove of great importance.

Many, I may say nearly all observers in our State, are unfamiliar with our Reptiles and Amphibias, and therefore notes might be misleading unless accompanied by specimens. To those inclined to collect, it is suggested that a pint of alcohol be purchased, and water added to it in proportion of 2 of alcohol to 1 of water. Specimens should be carefully washed and placed in this liquid, in a wide-mouthed bottle, preferably with a ground-glass stopper. For larger specimens, as serpents three to six feet long, and large turtles full strength alcohol should be used, and a cut made in the abdomen of the specimen to facilitate preservation, or alcohol should be injected into it by the mouth and other channels. With smaller specimens, as small snakes, frogs and salamanders no cut is necessary. It is rarely necessary to preserve large specimens, but nothing should be ignored.

In capturing specimens care should be used not to mutilate or bruise them, otherwise their value is greatly lessened. Even a slight blow with stick or stone will cause a snake to lose a portion of skin after it has been in alcohol for a time. There is but the single poisonous species of reptile, the Massasauga in Michigan, unless it proves that the Copperhead and Banded Rattler are found upon our Southern border, and with these exceptions all of our reptiles may be handled with impunity. There is absolutely no danger from poison.

When a specimen is placed in alcohol a tag should be attached to it. A simple number may be written on paper with a pencil, or better, stamped on metal and tied to leg or about the neck. This label should correspond to number in note book giving date, locality, name of collector, nature of land and water, forest or marsh, habits, abunbauce, etc.

After a fortnight in the preserving liquid the specimen may be taken from the bottle or can, rolled in layer cotton, wrapped strongly in paper and sent for identification by mail. The identified specimens will be returned on demand or will be placed in the keeping of the officers of the Academy of Sciences.

In conclusion the request is made for immediate information regarding the Salamanders, Newts and Tritons in the State. Those having notes or specimens for identification in the order *Urodela* will kindly commuuicate at once.

Michigan Academy of Sciences.
MORRIS GIBBS, M. D.,
Kalamazoo, Mich.

* The tailed batrachians (salamanders, newts, etc.) are generally known as lizards, but can readily be told from *scaled skin* lizards by the naked or smooth skin like the skin of our frogs.

Collecting and Preparing Ferns for the Herbarium.

The collecting of ferns for transplanting, and the collection of fronds for preservation as botanical specimens, are to be pursued at very different periods the year; and as the former has already been alluded to, it is to the latter that we are desirous of devoting a few pages. It may be premised that for botanical purposes fronds destitute of fructification are worse than useless unless they belong to species which produce distinct fertile and barren fronds. and in which the characters and appearance of these fronds materially differ. In such cases the two kinds of fronds should be collected and preserved together.

The period for collecting ferns for the herbarium is therefore manifestly that when the frutification has nearly attained to maturity, and it is always better to collect them on a dry day than on a very wet one. The collector should go out prepared for collecting ferns, if he desires that his herbarium should present a neat and respectable appearance when completed. Some recommend a vasculum, some a bag, and some a large book under the arm; but commend us to two half-inch deal boards, about 11 inches by 17, with a strap and buckle for each end, and 20 sheets of good bibulous paper, cut to the same size, and placed between them. Having selected a good frond or two for preservation, taking care not to break the stipe or stalk, but to separate it from the rhizome or root-stock, bend back the stipe just below the lowest leaflets of the frond, breaking the woody portion, but not dividing it from the rest of the frond, and lay it carefully between a sheet of your bibulous paper, and secure it with the spare paper between your boards; then proceed in search of more. Fronds, which with their stalks are not too long for the paper, should be laid in without bending.

In selecting fronds for preservation, it is not the largest that are required, but is rather advisable to collect such specimens as will lie comfortably between the papers without bending, than to aim at procuring *fine* specimens which may only prove to be a nuisance. A perfect frond of nine inches in length is better than a folded or otherwise mutilated one of nineteen inches. In selecting fronds, the fruit should not be too ripe, or instead of spores you will only find empty cases not to mention the rusty dust that will continually tint your papers. It is better that the spores should be scarcely matured. Then, again, it should be noticed whether the frond is eaten by insects, broken, or in any other way imperfect. Such specimens are to be avoided if others can be obtained. Finally, the specimen selected should be well grown, and not distorted, unsymmetrical, or exhibit a tendency to sporting or departure from the general type of the neighbouring fronds.

Having collected what specimens are required and conveyed

them home, the next process consists of drying them for the herbarium. This is accomplished by removing them from the papers in which they have been collected, and transferring them to fresh paper. Some persons are content with a stout unsized paper, such as employed by grocers for wrapping sugar, others will proceed to blotting paper, whilst the majority will admit that Bentall's botanical paper is decidedly the best. The ferns should be transferred to a sheet of drying paper; two or three thicknesses, or even four or five, may be placed upon it, and then another specimen, and thus *ad libitum*. When all are in this manner transferred, the pile should be placed in a press, or with a stout board above and below, loaded on the top with some heavy weights, stones, bricks, old books, or anything applicable for the purpose. Twenty-four hours at the least, and forty-eight at the most, they should remain unmoved. At the expiration of this period each specimen should be transferred to a dry sheet of paper, with three or four thicknesses of dry paper between each specimen, and again put under pressure for the same period. The damp paper from which the specimens are taken should be at once dried in the sun or before the fire. It is always advisable to change the papers in which specimens are being dried at least four times during the first week; some persons change them daily. After the first week, if placed between the folds of a fresh, dry sheet of paper once a week, and kept under a moderate pressure for a month, the drying process may be considered complete. No specimen should be transferred to the herbarium in less than a month from the time of its being collected.

There is one small caution which must not be forgotten. A specimen should never be put under pressure to be dried without being accompanied by a small scrap of paper, on which is written the *locality* where the specimen was collected, and the *date* of collection. A name can be added at any time, since the specimen itself will furnish the data from whence this may be determined; but it will be impossible to furnish localities and dates with any precision at a future occasion, and upon the accuracy of these much of the value of the specimen will depend.

Before the specimen is permanently transferred to the herbarium, it should be *poisoned*, to prevent its injury or destruction by mites and other predacious little pests. A small quantity of finely powdered corrosive sublimate—about as much as will lay on a fourpenny piece is sufficient—should be put into a bottle containing 4 oz. of spirits of wine, and permitted to stand for a day or two shaking the bottle occasionally in the interim. With a small brush this solution should be brushed all over each specimen on both surfaces, and then, when thoroughly dried, it may take its proper place in the herbarium.

Opinions may vary as to many of the minor details of a herbarium; bnt, at the risk of not pleasing every one, we will present a scheme for the construction and maintenance of a herbarium of British ferns.

The paper on which the specimens are to be mounted should not be too thin; a good cartridge paper will answer every purpose. The standard herbarium size is about 18 by 11 inches. This is as large as any one could desire. Each *species*, at least, should have the whole of a sheet devoted to it. The larger ferns will require a separate sheet for each *variety*. The specimens should be laid on the paper with the under or fructifying surface uppermost, and the barren side of the frond applied to the paper. Small strips of gummed paper, about an inch in length, and not more than one-eighth of an inch in width, should be laid across the principal and secondary ribs or branches of the frond, and each end fastened down to the sheet of paper; other pieces may, in like manner, be placed across the tips of the fronds, or wherever else appears to be necessary to secure the specimen to the paper. It may be suggested that too many such slips disfigure the specimen, and if there are not sufficient it cannot be retained in its place. Experience must be the best teacher. Some object to fastening the specimens to paper at all, others recommend gluing them down by the whole surface. Both these plans appear to us to be equally objectionable. If the specimens are loose, they are not only in danger of being broken or damaged, but of being misplaced and dissevered from the label which belongs to them. If wholly glued down they cannot under many circumstances be removed from the paper, either to be transferred to other paper, or for closer examination or comparison.

Each specimen having been mounted, the label which accompanies it should be fastened down beside it. This may be pasted. Finally, its generic and specific name should be written legibly at the lower *right*-hand corner. All the specimens belonging to one genus should then be collected together, and placed between the folds of a sheet of paper half an inch wider and longer, when folded, than the half-sheets upon which the specimens are mounted: These "genera covers" may be of the same paper, or a smooth brown paper may be employed for the purpose. On the outside of the "genera covers," at the lower *left*-hand corner, the name of the genus should be written in a good bold hand. The whole may be transferred to a deal box, the front of which is movable as well as the lid, being hinged to the bottom, so as to fall down and lie flat on the table. The lid may be so contrived as to hold the front in its place when closed. A deal box 9 inches deep, 13 inches wide and 20 inches long will hold a good collection, and if this ever should prove too small for the number of specimens obtained, a second box of the same dimensions will remedy the evil. The order of succession in which the genera are placed in the box may be taken from this volume, which will then serve as an index to the herbarium.

If it is considered desirable, a little camphor may be kept with the specimens, but the best preservative will be to look them all over, and thus allow the air to have access to them, once in every six months. With such precautions a collection may be preserved uninjured for years, provided always that it is kept in a *dry* place—not moderately, but *thoroughly* dry—or "mould" may injure irremediably what insects have spared.

A neat little collection of ferns, of smaller pretensions, and less claims to be regarded in a scientific light, may be arranged in a kind of album or scrapbook, with "guards" introduced by the binder sufficient to compensate for the extra thickness caused by the insertion of the specimens. A tinted paper is often used in the manufacture of these books, which the good taste of a lady may transform into a very interesting volume for the drawing-room table.—*From Cooke's "Fern Book for Everybody."*

A Furore

Has been created among Collectors and Naturalists by

LATTIN'S

JUNE

NATURALIST'S BULLETIN.

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The sale is for JUNE ONLY, and will neither be repeated nor extended. It may be the opportunity of a life-time ---it certainly is of the year.

That "$10,000 worth of Specimens and Curios" is vanishing with the rapidity of snow-ice before a mid-day's sun in dog days.

$2,000 worth of stock has been disposed of during the first ten days of the sale. If you have not a copy of the June "Bulletin," procure one instanter.

Write! Wire! Act Quickly! Delays are Hazardous!

Hastily, but Faithfully,

FRANK H. LATTIN, Albion, N. Y.

Natural Science News.

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No Collection Complete

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Trap-door Spider Nests!

(Usually sold as Tarantula Nests.)

Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only **50c.** Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

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Ancient stone relics from Southern States Sale.

Arrow points 20, 35 and 50c per doz. Spearheads 10, 20, 35 and 50 cents, some 7 inches and more long. Grooved axes large 50c to $1.00 each. Celts, all sizes, 15 to 75c. Idols, perforated stone knives, charms and many other implements at reasonable prices. Perfectly transparent arrow points from 10 to 50c each. These are beautiful gems All these relics show a wide range of material and workmanship.

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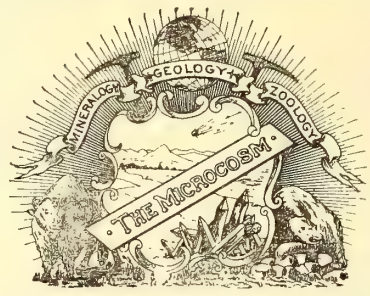

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	Price per egg.
King Rail, 1-12, 1-11	.10
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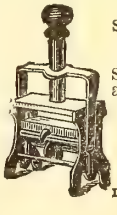

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NATURAL SCIENCE NEWS

VOL. I. No. 21. ALBION, N. Y., JUNE 22, 1895. Weekly, $1.00 a Year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

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ALLIGATORS. We now have among this spring's collections a fine lot of Alligator Skulls, Teeth and Skeletons. Also skins, live and mounted Alligators, "Gator" Oil, "Gator Musk and "Gator" Leather. These "Gators" were all secured by ourselves on collecting trips and have been prepared in first class shape. We will sell any of them cheap for cash, or will exchange for any of the best works on Natural Science. For 50 cents we will send you a large polished "Gator" tooth dog call or whistle. Address THE EBERSOLDS, Oceanus, Brevard Co., Fla.

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MATTESON & MATTESON, Turner, Ore. Breeders and dealers in Mongolian Pheasants, Oregon Quail and Japan "chin" Dogs. We are Taxidermists and collect some. Have for sale Calif. and Oregon useful woods, pair deer horns in velvet, 8 points: samples gold-bearing sand, Oregon coast: Showtl (Mountain Boomer) mounted and some other things. Correspondence solicted.

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Large Resurrection Plants,

By mail, 10c. Small, 5c. G. W. TUTTLE, 19tf-o Pasadena, Calif.

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A Fern Book for Everybody.

124 pages, colored plates, bound in cloth and gilt, prepaid for only 50c. Address, FRANK H. LATTIN, Albion, N. Y.

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Bird Skins and Eggs a Specialty.
PRICE LIST FURNISHED FOR STAMP.
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Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:30
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion..... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

No Collection Complete without one of my

Trap-door Spider Nests!

(Usually sold as Tarantula Nests.)

Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only **50c.** Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

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SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

Don't forget one of those new frost-like crystallized Chalcedony Geodes from Cheyenne river, size of hen's eggs $.25 postpaid or half-size $.15.

Beautiful orange crystals of Calcite, Cheyenne river $.15 to $.50.

Wine-colored Barite xls $.10 to $.50.

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Natural Science News.

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After the starch ceases to make the mixture look milky it is cooked, but at least an hour's time will be required.

Keep in large mouthed tightly corked bottles, or when done pour into a tray covered with strong paper, spreading it evenly over the paper, allow to dry; when dry enough, moisten back of paper and remove it from the gum, dry again thoroughly, break into fragments and preserve for use in a wide mouth stoppered jar.—*Random Notes.*

New Jersey's Sunken Forest.

The following clipping was published in a state paper some time ago:

"There is a sunken forest of white cedar in New Jersey which has been continuously 'mined' for its valuable timber for over 80 years. The curious industry of digging for the sunken logs is carried on by the people of Dennisville, Cape May county, a village which was brought into existence solely through the wealth of the buried timber in its vicinity. Over the sunken forest, trees of large size are growing, and in many instances these are cut away in order to get at the more valuable timber, which lies only three or four feet below the surface. All the sunken trees are of enormous size, two to five times larger than those now growing on the surface. The exact age at which they lived is a matter of curious conjecture. It is probable that they were buried many centuries ago by the action of an earthquake."

In reading an article of this description one is apt to pass it as fallacious. I want to certify to what I have seen of the sunken forest.

When I was in my teens my grandfather came in possession of a tract of cedar swamp, several miles from home; not at Dennisville, though, but perhaps forty miles to the north-west, on a branch of the Maurice river known as Beaver Dam Creek, which crossed the tract in a crooked, diagonal direction.

He took a surveyor, and his sons, and divided it into five tracts, and sold these divisions to his children. These brothers and sisters, with some of their children, would make annual visits to the swamp to see how it was coming on, and we would have a regular picnic traipsing through the almost perfectly straight trees, admiring their beauty, hunting teaberries and cranberries (if at that season), crossing the creek on fallen timber or jumping from stump to stump, and quenching our thirst from the clear, cool, wholesome water. One of the duties of the fathers was to re-open the lines made by the surveying when it was run out.

The cedar (white) timber was, in most places, very tall, and in some places it stood so close that it was with difficulty that we could squeeze through. We had glorious times cutting and barking the timber, the latter being the boys' duty when they were not wandering around hunting new fields or going to a certain spring for a drink. And did not the exercise and the pure uncontaminated cedar air give us appetites, though? The timber was sawed into 5/8 inch boards for siding, into singles, and cut into rails, stakes and posts for fences; also ladder and marking-out poles; and we boys got lots of cow gads.

In our trips there we got acquainted with "swamp rats"—men who worked and almost lived in the swamps. Many of them made a business of getting out sunken timber, buried beneath the timber that we were after, which was growing and feeding on that below the surface. These logs were in a horizontal position and very easily traced along the surface by a slignt mound. The men after finding one that they thought would pay to work, would cut and dig out the moss and roots growing above, saw off the log in about two foot lengths, pry up and roll out and split into shingles, mostly about six inches wide. The heart of this timber was mostly perfectly sound and made the best of shingles, very straight grained, and commanded the highest price in the market.

The timber growing above the sunken forest ranged in size from very small to about one foot through. At one place I remember one gnarled, rough old trunk leaning across the creek that no doubt belonged to the generation or its sunken brothers, and had by some means escaped the fate of them, There were on one corner of father's tract fourteen very large old yellow pine trees. They, too, undoubtedly belonged to the generation of the fallen. The cedar swamps are found along both sides of the creeks and branches. In my opinion the sunken forest was destroyed at a recent period, whether by earthquake or tornado is only conjecture. I think the latter. There was apparently no trace of sunken timber outside the swamp.

Is it not reasonable to suppose that a tornado had swept through here and the timber in the swamp not being firmly rooted was easily leveled to the surface, and in the course of years, being flooded by water and overgrown by moss, was made the seed bed of the present growth of trees, the seed of which was carried thither by wind, water and birds.

Before leaving the subject I will state that across the swamp were well defined traces of an ancient dam, which no doubt was the work of that industrious, and now, in that region, extinct animal, the beaver.

S. M. EDWARDS,
Argusville, N. D.

Found $200 Pearl in a Free Clam.

Patrolman Theodore Miller of the Larrabee street station is fond of clams-on-the-half-shell. Being off duty and hungry Saturday night Miller went into George A. Cless' saloon at the corner of Orchard and North avenues, where the following legend was displayed: "A Clam With Every Drink."

Miller paid 5 cents and stood up at the counter. After a "beer" the proprietor, who had broken Miller into police work when himself a patrolman at the East Chicago avenue station three years ago, opened a clam. Miller bit something gritty and picked from his teeth four seed pearls. He handed them back to the saloonkeeper with a remonstrance about the "bones in his clams." He was given another with the invitation to find a pearl in that if he could.

Miller bit hard a second time and nearly pushed the fillings out of two molars with a hard substance a half-inch long, in shape like a capsule. It was smooth and so hard he could not scratch it. Half an hour later the policeman was offered $150 for the specimen by Jeweler Zeitz at 274 East North avenue. It was sent to a lapidary yesterday, who said the pearl was quite rare and was worth over $200.

Saloonman Cless has taken down his old sign. In its place one may now read this edition: "A Pearl with Every Drink. Sure Thing!"—*Chicago Record.*

The Cincinnati Zoological Garden has sold its giraffe, Daisy, to Barnum's show for $6000. The cost of transportation was $5000. The time consumed in removing it from its yard to the special, large and well padded wagon, was five hours.

One day the children were having an object lesson on the Great Blue Heron. The teacher called attention to its small tail, saying: "The bird has no tail to speak of." The next day she asked the scholars to write a description of the bird, and a little German girl wound up by saying: "The Great Blue Heron has a tail, but it must not be talked about."—*Ex.*

Cleaning of Slides and Cover-slips.

The thorough cleaning of slides and cover-slips is certainly a very important factor in the preparing of bacteriological specimens. Specimens contaminated with particles of dust, fat and bacteria which exist in the air are mostly the results of using dirty slides or cover-slips.

In order to prepare good specimens the distribution of organisms upon the slide or cover-slip must be uniform and in as thin a layer as only possible, and when dirty slides or greasy cover-slips are used, these results can not be obtained. Many methods for cleansing slides or cover-slips are in use, but I shall only mention those which are simple and render the slides clean enough for ordinary use.

The simplest method with new slides and cover-slips is to wash them in warm water and then immerse them for a few hours in strong nitric or sulphuric acid. After this they are rinsed in water, then in alcohol, ether or chloroform from which they are removed to a suitable vessel containing equal parts of alcohol and ammonia.

Slides and slips which have been previously used are freed from all coarse adherent matter and boiled in a strong soap solution. They are then rinsed in clean water, followed by rinsing in alcohol or ether and, finally placed in a mixture of alcohol and ammonia. From the soap solution they may be transferred to nitric acid and then treated the same as above.

In Loffler's method, the cover-slips are warmed in concentrated sulphuric acid for some time and then rinsed in water, after which they are placed into equal parts of alcohol and ammonia.

Slides are best kept in a museum jar which is about four inches high and three inches in diameter, while slips are kept in a small glass-stopped bottle. When the slides or cover-slips are to be used they must be wiped dry with a clean cloth from which the fat has been extracted.

Victor F. Mueller,
Member of the Long Island College Hospital,
Brooklyn, N. Y.

Amber's Ancient Glory.

That a string of amber beads around a child's throat will keep off throat troubles is a world-worn superstition. While the learned doctor may pooh-pooh the efficacy of the beads, thousands of mothers will swear by them. The idea antedates the Christian era. Poppæa made Nero dress the amphitheatre at Rome with amber, and had shields of it broken in the arena to prevent the infectious odor of the common people from reaching her when at the games during an epidemic in Rome.

The first use of the amber as a mouthpiece for pipes followed, when the Turks learned of its alleged quality of not carrying infection. Such mouthpieces were first fitted to the public pipes, those which are passed from mouth to mouth in the markets, a score or more being attached to one large bowl containing tobacco. For nearly 3,000 years the world's supply of amber has been taken from the region which lies between Frische-Haff and the Kuriche-Haff on the Samland peninsula in Prussia, and it is more than likely the "amber gatherers of the North," the mystic Æsti of pre-historic days, gathered it there for the 40,000-year-old worship of the Brachmans. Traces of amber have been found in Hindostan, and some far-reaching veins of the Prussian deposit have been found in Norway, France, Germany, Poland and Russia, but never in working quantities. Two years ago an important discovery of amber was made by O. J. Klatz, the Government astronomer of Canada, who reported finding an extensive mine at Saskatchewan, near Cedar Creek. This discovery is the more important because it is a fact well established, though carefully denied by the Samland people, that the Prussian supply is about at an end.

The gathering of amber is no child's play, but is frought with privation, hard work and danger. The mother whose baby wears a string of the yellow beads around its tiny throat has little idea of the risks run in gathering them.

When the gathering of amber first commenced in historic times, a rude, hardy body of men banded themselves together and lived on the bleak Samland, waiting until the storms rolled up heavy seas, and so loosened the wealth which lay at the bottom of the shore water, held fast by rocks and sand. When the storms abated the hardy fellows, with long poles shod with hooks of iron, ventured shoulder deep into the rolling, icy surges, and raked up and carried ashore the pieces detached by the surges. These were laid in houses on the beach, and were roughly sorted by the women and old people, and sold

for the benefit of the community.

In the fifteenth century the Teutonic Knights received the right to collect the fragrant gum, and it was they who first conceived the idea that the veins must run under the land, and so commenced to mine for it, as well as to fish for it. Then the Government eventually took hold of it, and today the privilege is leased to the firm of Stantien & Becker, who pay the Government about $250,000 a year for the privilege.

With the progress of modern times the old-time worker waiting for storms disappeared, and in his place came large boats, equipped with experienced divers, who could go to the bottom and detatch the rich deposits. The reef was found to extend 600 feet in length and 400 feet in width, and to be a mass of almost solid chunks of amber. What had furnished the richest finds of other days was seen to be only the fringe of the great mass. Storms let the divers work only about nine months in the year.

The diver's dress differed from the regular suit because the amber seeker had to work in a recumbent position. The helmet was fiixed sloping forward, instead of erect upon the shoulders, and the goggles were placed at an angle looking downward instead of straight ahead. On his back he carried a curious reservoir or box which was supplied with air by the pumps in the boat, and was fitted with a valve arrangement to give just one respiration of air at a time. Another special pipe carried off the carbonic acid gas as exhaled. This reservoir and its attachments were rendered necessary by the hard breathing produced by the heavy work, and the necessity for the diver to stay below and carry away whatever pieces of amber he might start to loosen, because, if left, the sea would possibly carry the amber away. Some of the lumps obtained required four divers to loosen them and get them to the surface. The work was so hard that even in the depth of winter, when the water is very cold, the men would come to the surface bathed in prespiration.

Then came the day of steam dredges. In 1891 the product of the reef was 201,500 kilograms of amber. In that year the operations on the reef were discontinued, because of the exhaustion of the supply under the water, and the land mines, which had only been partially worked, received closer attention.

In the early days of the mines, fifty years ago, there were endless troubles among the men, and disputes over the rights to certain patches between the Government and the landowners. "Moonlight" amber was then as omniprest a fact as "moonlight" whiskey in Tennessee. Then the Government passed a very stringent law against digging for amber under any circumstances until the formation of the present company, with its modern methods and appliances.

In the mines were encountered greater dangers than those of the storm and undertow. All the veins ran out toward the sea; presumably to the reef. The amber was found mixed with heavy grey-blue clay, and above and around this clay was sand, so that a miscalculation of position, a chance blow with a pickaxe or spade, or the clearing away of a rock either by the men in the tunnel, or at the bottom of the ocean by a heavy storm, might at any moment produce a weak spot into which the water might soak and soak, then drip and drip, until suddenly the corridors would be flooded from end to end. The corridors were shored up with timbers, Government inspectors were appointed, and great pumps were kept going day and night, for as the men were always working at the far ends of each corridor, on new ground, it was only eternal watchfulness which gave even the promise of safety.

In spite of all vigilance, in February, 1891, just such a fissure was made in the ocean bed, and a flood poured in beyond the power of the pumps to cope with. It occured at night. If it had taken place during the working hours not a man in the corridors could have escaped. Search proved that the main fissure was above the usual high-water mark, and that an unusually high storm had driven the water up to it after a three days' gale. This fortunately is the only recorded disaster in the mine up to date.

The miners go down into the corridors carrying a pickaxe. Strapped at their belt is a curiously shaped basin, in which the smaller pieces are piled, the large pieces and the drift being carried away on small trucks similar to the "jenny truck" in a coal mine. The contents are hoisted to the surface by elevators. When a miner leaves the corridor, he is as thoroughly searched as the workers in the diamond mines at Kimberly.

When the amber has been washed and the pebbles have been picked out it is passed into revolving drums with a certain amount of sand, which scrubs off the outer surface or matrix. It is then sorted into about 100 varieties, according to color, shape, cloudiness or texture. Flat pieces are for smokers' goods, round pieces for beads and fragments for varnish. The classification has been in a measure changed of recent years.

An American has discovered a process by which the small pieces of amber may be welded together and made into slabs, so that the size of a piece is no longer a great commercial factor. The size used to be an important element in the price. Now it is as easy to make a pipe mouth-pieee ten yards long, as it was formerly to make one one or two inches long. At the World's Fair a cigarette mouth-piece was shown that was a spiral over 50 inches in length; its price previous to the discovery of the new mode of manipulating the gum would have been simply fabulous, if, indeed, it could have been procured at all.

The pale pieces of amber go to the pipe makers of Turkey, Egypt and the Levant; the light, whitish-colored to the ornament makers of Italy, the full yellow to the traders in Africa and the South Seas, while the finest grades of clear, clouded, green (rarest of all), gray and blue are distributed among the United States, England, France and Germany. In the old days all clear amber was from the sea, and all clouded from the mines, but now both varieties come from the mine.

In 1893 there was harvested about 405,000 pounds of amber, valued at $500,000. The Prussian expert, Herr Van Muden, is on record as stating that the supply is nearly at an end, and that the mine may become unworkable at any time. In the history of the mine only one foreigner is known to have received permission to inspect the workings and he was an American, from whom much of the information given in this article was obtained.

The question remains, what is amber? Men of science say that ages ago, long before the time when children were baptized with the cross of the Hammer of Thor; long before King Olaf carried the Gospel of the White Christ into the Norseland, and Earl Eric carried at his side the mighty sword

with the hilt of amber in which stirred the worm which gave him warning of the storm and fight; long before the destruction of the Frost-Bridge and the coming of Ragnarock, there stood on the Samland a mighty forest of conifers whose descendents today are found in California and Oregon.

In those days this land was called "Nifleheim, the land of eternal winter." These trees piled up around their roots the golden gum until theDrift Period wiped out the face of nature as the surf breaks down a child's castle of sand, and rolling over the fragrant forest, left only the ever restless sea. The Greeks, ever poetical, had a legend that when Phæton drove the horses of the Chariot of the Sun and was hurled thence by Zeus he plunged into the Eridanus, and was killed, and that his sisters bewailing him, were turned to trees, their tears congealed around their feet as they fell.

Cuniform inscriptions show that centuries before the Christian era, caravans from Asia journeyed to the Baltic for amber; to the barter of this gum with Thrace is due the introduction of bronze into Scandinavia, and in the museum at Copenhagen are Etruscan vases exchanged for amber at a prehistoric period.

Amber may be traced through the world as a love philter, a charm against sickness, contagion, blindness, sorcery, witchcraft, poison, deafness; as incense to the old dead gods; its fumes have rolled above the suttee of the Hindostani widow, through the temples of Brahma and the temple of the Sun at Heliopolis, in front of which stood the obelisk now in Central Park; back as far as tradition runs, stretches the story of amber and its preventive and healing powers.

800 unclassified insects and 163 unknown plants have been found embedded in its clutch. The largest piece in the world weighs only thirteen pounds. And today, with science advancing by strides in seven-league boots, amber laughs at the inventor, for counterfeits and even the small pieces fused together may be distinguished from the original natural pieces by a magnifying glass fitted with a Nicol prism. At one time Nassau street was alive with amber workers, but except in a few isolated instances amber work is dead as an American industry. It is cheaper to import it, and amber jewelry is no longer fashionable.—*The Mineral Collector.*

Arsenic-Eating Cats.

A true history of Felis Minerva Thessalonius Beefsteak Yourself Euphrates Tobias Saturday Polyphemus Tassel-tail Arsenic.

It is not my intention to "cut any ice" * as an humorist; neither, to occupy your space with a senseless dissertation on cats. This is an honest chronicle of the acts of a certain feline, whose career was strewn with mishaps and adventures, many of which intimately concerned the writer.

The interesting animal described, as at the heading of this o'er truthful tale, and the name of which we will not again use in its entirety, for the sake of brevity, was a white cat of amiable disposition, but of sly ways (after the manner of cats) and was the property of myself when I was a "Kid." †

Of course, that must have been many years ago, but then that makes no difference as to the truthfulness of my narrative, which concerns scientific facts, to which we will settle down in a short time, and as soon as we can fully dispose of the feline's cognomen; which is somewhat long, as may be seen above. I am much inclined to think that a portion of the name has slipped my memory, but that is certainly fortunate for my readers, and lets me out of a long explanation.

Well! you see; when I was a "Kid," and read books, every character of worth was given prominence, in my daily life, by the application of the name to some animal. Therefore the name of Minerva was adopted because my cat was wise. Polyphemus, she was called, because she had but one eye.

Then, too, when she had any adventure like stealing a steak from the kitchen, it too, was recorded. In some way her tail was broken and badly injured, and it lopped over and stiffened out at right angles; and so the name of Tassel-tail was adopted. So now you see we are getting down to the "tail-end" of her name, and near to our final mark.

Well! do you believe it—that cat would eat arsenic? Not in the rough, or clear, to use professional terms. But as a central part to a sandwich; the outer substance being my bird skins. It is a fact that she ate a score of my freshly prepared bird skins, and I have good reason to believe that Felis Minerva —— —— —— —— —— —— Tassel-tail Arsenic would have devoured my entire collection if she could have opened the cabinet, and had her stomach held out.

She began with one skin, and downed it root and branch, bill and feathers, and was just beginning on number two when I appeared and she took a header out of the window.

Of course, she was given up for dead, and the kind remark was made—"good enough for her." But she did not "shuffle off." and beyond a serious disruption of digestive processes, and a tendency to seek quiet, she appeared "O. K." * Next day she was observed eating grass, species not identified, and catnip, *Nepeta cataria*, and seemed contemplating another raid on my skins.

Not long thereafter, on my return from the woods it was found that this lover of crude drugs had principally gobbled, devoured or chawed, four more of my precious skins, and I was exceeding wroth thereat, but I was bound to see it through, and let this living representative of antitoxic principles have her way.

It is said that some women take arsenic for their complexion, but this could not have been the idea with Minerva ——, for her complexion was white any way. But before she had made her last raid on my birds, she had begun to lose her hair in spots; a condition which dermatologists would call *alopecia areata.* Then she had the shakes and finally the regular *jim jams* and went "up the flume," "skipped the gutter;" or in other words mounted the "golden stairs."

And thus is ended the history and existence of this old, white cat, who tried to educate herself to eat arsenic as a condiment. She had nearly acquired the nack; but like the horse who tried to eat shavings when he wore green glasses, —— ——.

Farewell Felis Minerva —— —— —— —— —— Arsenic.

SIMON SLOGO.

* "Cut ice" is not strictly speaking, slang; and may be scientifically done with a saw in cold weather on the congealed surface of a body of water.

† "Kid" is a proper word, and is used in application to a child in one of Shakespeare's best plays.

* "O. K." is not, strictly speaking, scientific, but my readers will not be too critical, I trust, when it is explained that it means "Oll Korrect."

A Furore

Has been created among Collectors and Naturalists by

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JUNE

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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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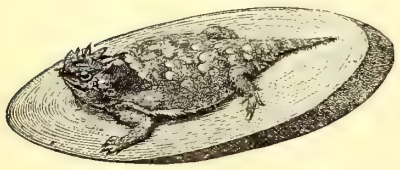
All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

HORNED TOAD,
Phrynosoma.



Beautifully mounted on California Orangewood. No poor shoddy work. An ornament to any collection. It is well known that my work in this line is the best on the market. Sent by mail for 50 cts. Postage stamps not taken.

G. W. TUTTLE,
Pasadena, Calif.

Southern Indian Relics.

Ancient stone relics from Southern States Sale.

Arrow points 20, 35 and 50c per doz. Spearheads 10, 20, 35 and 50 cents, some 7 inches and more long. Grooved axes large 50c to $1.00 each. Celts, all sizes, 15 to 75c. Idols, perforated stone knives, charms and many other implements at reasonable prices. Perfectly transparent arrow points from 10 to 50c each. These are beautiful gems All these relics show a wide range of material and workmanship.

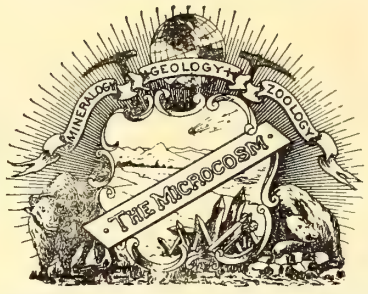
We make a specialty of fine North Carlina Quartzes and Gem stones in rough, and have on hand a large stock at all times for sale at reasonable prices.

Write to us what you want.

SOUTHERN MINERAL CO.,
Successors to E. H. Harn,
Henry, Lincoln Co., N. C.

Modern Indian Relics.

For sale at a bargain, for cash, a collection of Modern Sioux Relics. Ghost Shirt, War Club, Moccasin, Bow and Quiver of Arrows, Knives, Scabbard and Whetstone. Fine Pipestone Pipe and ornamented Tobacco Pouch. Points, Bags, Whip, Bone Necklace, Waist Belts, &c. All collected at Pine Ridge and in first-class condition. E. H. HARN, Henry, Lincoln Co., N. C.



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t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

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Birds Eggs
in sets.

	Price per egg.
King Rail, 1-12, 1-11	.10
Acadian Flycatcher, n-3	.10
Yellow-breasted Chat, 1-4	.05
Carolina Wren, 1-4, 1-5	.10
American Woodcock, 1-3, (not quite first-class)	.75
Blue Grosbeak, 1-3, 1-4	15
Cooper's Hawk, 1-3	.25
Pine Warbler, n-3, n-4	.30
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All first-class with full data.

Bird Skins, Mammal Skins,
Reptiles and Batrachia.

H. H. & C. S. BRIMLEY,
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CRYSTALS.

If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large, movable water drops, as large as peas; **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

Rutilated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Columbite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Octahedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address,

J. H. RUGG,
Box 262. **Blairsville, Pa.**

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

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Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).
35 cents postpaid.

"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

CHAS. K. REED,
Naturalist and Taxidermist,
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Manufacturer of Oval Convex Glass Wall Shades (Patented).

A specialty made of fine work on Fish and Game Heads or Large work of all kinds.

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TAXIDERMIST,
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Bird and Mammal Skins,
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Alta Mira, Estado de Tamaulipas, Mexico.

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ONE GIVES RELIEF.

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NATURAL SCIENCE NEWS

VOL. I. No. 22. ALBION, N. Y., JUNE 29, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WILL EXCHANGE.—Eight (8) vol. "Outing" Magazine: Eight (8) vol. "American Field"; Two (2) vol. "Forest and Stream:" Sporting books: fine fishing tackle: Telescope, Compass and lots of other truck for best offer of specimens, shells or minerals. What have you? C. D. FIELD, Thayer, Mo.

TO EXCHANGE.—For Wood's Natural History, complete or a 32 Winchester. The Soldiers in Our Civil War, 2 vols., 950 12x17 pages, 300 Ills., value $16. O. W. CHANDLER, Elkdale, Susq. Co., Penn.

NOTICE.—Sets and singles of Texan birds in exchange for singles not in my collection. No sets wanted. Address GEORGE S. DOWELL, Austin, Texas.

20 VARIETIES of stamps, all different for 5 cents. Agents wanted for our fine approval sheets at 50 per cent commission. CRESCENT STAMP CO., 28 Ripley Place, Buffalo, N. Y.

LOOK! I will sell my 32 *X L* Bull Dog Revolver in good order for best offer over $1 00. Make offers! All answered. WM. GILBERT, Elk River, Minn.

WANTED.—Sets with original data, many common ones desired. Will give double value in good 1st class singles. Send your list and receive mine. H. B. HASKELL, 497 Winnebago St., Decorah, Iowa.

TO EXCHANGE.—Eggs in sets and singles to exchange for singles. All letters answered. GEO. ZIMMERMAN, Austin, Texas.

TO EXCHANGE.—Zinc ore, fossils, postmarks, for curios, fossils, ores, minerals, shells, stamps. Will buy Columbian stamps. Correspondence solicited All letters answered. FR ED HENNEY, Girard, Kas.

CHOICE Arizona sets, first-class with data, to exchange. ROBERT A. CAMPBELL, Boulder, Colo.

WANTED.—Situation in Natural History establishment,or as class-room teacher of Mineralogy and Chemistry. C. T. MORGAN, Claremont, N. H.

EXCHANGE.—Fossil coral (*Columnaris alveolata*) for Indian relics stamps, etc. GEO. M. COULTER, Golden City, Mo.

FOR EXCHANGE.—S a Shells, Indian Arrow Heads, etc., for other nice Indian Relics. Correspondence solicited. All letters answered. WM. T. BUSH, Hyram, Russell Co., Ala.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls"or finds.,"EDWIN E. HOWELL, 612, 17th St. N.W.,Washington,D.C.

WANTED at once an A No. 1 adult skin of Bald Eagle and eggs of Hooded Merganser and Swallow-tailed Kite. singles or sets. Address stating best cash or exchange price. FRANK H. LATTIN, Albion, N. Y.

MINERALS, Corals, Fossils, Shells, Curios, etc. Agts to sell stamps, big commission. 2c stamp for catalogues, circulars, etc. CARL W. IHLING, 103½ W. Main St., Kalamazoo, Mich. 21-2t

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

FOREIGN COINS and stamps,stamp papers, OOLOGISTS, Magazines, sea curios, Scott's (1894) stamp catalogue, California Giant Tree Bark, petrified woods and roots for a tent and revolver or stamps. ROBERT L. STEPHENS, Danville, Ills.

I HAVE 1500 small T perches. 3 inch base, oak fine finish 8c each; pine painted white at 6c each. Will take half cash and balance in exchange. I will turn any kind of T perches, round flat stands, bases for glass shades or anything in the line at a very low price. Write for prices. E. L. HALEY, Phillips, Maine.13t5

PALMETTO Scrubbing and Dusting Brushes, Fly Switches, Plain or Fancy Braid for Hats, very durable Fans and Mats. Made at home on rainy days. Send 25 cents for samples. THE EBERSOLS, Oceanus, Brevard Co., Fla.

ALLIGATORS. We now have among this spring's collections a fine lot of Alligator Skulls, Teeth and Skeletons. Also skins, live and mounted Alligators, "Gator" Oil, "Gator Musk and "Gator" Leather. These "Gators" were all secured by ourselves on collecting trips and have been prepared in first class shape. We will sell any of them cheap for cash, or will exchange for any of the best works on Natural Science. For 50 cents we will send you a large polished "Gator" tooth dog call or whistle. Address THE EBERSOLDS. Oceanus, Brevard Co., Fla.

GERMAN taught by mail, exercises corrected,&c. Advanced pupils preferred.Natural History books or specimens taken in exchange. Address with stamp. ANGUS GAINES, Vincennes, Ind. 20-2t

TO EXCHANGE.—For one month from date my Process of Embalming, and Artistic Mounting will be offered in exchange for first class specimens. My price is 75c cash, but I will accept three dollars worth of bird skins, eggs in sets, minerals and other curios; all to be in first-clats order, in exchange for my Instructions in Embalming and Mounting, together with one pound of prepared Compound, enough to prepare thirty to fifty small birds. When you write for exchange stating what you have, enclose a stamp for reply. MORRIS GIBBS, M. D., Kalamazoo, Mich.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet Specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

FRANK B. ARMSTRONG,

TAXIDERMIST,

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Bird and Mammal Skins,

Birds Eggs in fine sets, Mounted Birds and Animals.

Alta Mira, Estado de Tamaulipas, Mexico.

YOU CAN GET YOUR PRINTING a little **CHEAPER** or a little **BETTER** by sending to **A. M. EDDY, ALBION, N.Y.** A specialty of natural history printing, catalogues, books, magazines &c. 100 envelopes, 100 letter heads and 100 cards, all for 100 cents. Send for samples of our printed stationery. 9

Large Resurrection Plants,

By mail, 10c. Small, 5c. G. W. TUTTLE, 19tf-o Pasadena, Calif.

To Dealers and Collectors: Will furnish small Fossils, Shark's Teeth and Corkscrew Fossils from Stafford Co., Va., for $1.50 per 100. The fossils are something new and unique. GEORGE W. KIRTLEY, Fredericksburg, Va. Ao-10n-e3mo.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs,** including *Falco tinnunculus,* etc., etc.

HERMANN ROLLE,

INSTITUTION FOR NATURAL HISTORY,

Emdener-Str. 4, Berlin, N. W., Germany.

BAKER & HANSON,

Collectors of

Florida Sea Shells and Curios.

Bird Skins and Eggs a Specialty.

PRICE LIST FURNISHED FOR STAMP.

FORT MYERS, FLORIDA.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa.4yr

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

RARE SPECIES

Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

CALIFORNIA WOODS! Fine collection of California Woods, 20 different varieties cut in plaques, half plaques, &c., each kind stamped with name, mailed for only 75c. These collections include such woods as Orange, Almond, Pomegranite, Prune, Manzanita, Mountain Mahogany, Umbrella, Wild Coffee, &c. G. W. TUTTLE, Pasadena, Calif. 19tf-o

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NEW YORK CENTRAL

& HUDSON RIVER R. R.

THE FOUR-TRACK TRUNK LINE.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12.22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00

No Collection Complete without one of my

Trap-door Spider Nests!

(Usually sold as Tarantula Nests.)

Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only **50c.** Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

G. W. TUTTLE,

19tf-o PASADENA, CALIF.

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SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

Don't forget one of those new frost-like crystallized Chalcedony Geodes from Cheyenne river, size of hen's eggs $.25 postpaid or half-size $.15.

Beautiful orange crystals of Calcite, Cheyenne river $.15 to $.50.

Wine-colored Barite xls $.10 to $.50.

Tetrahedron xls Chalcopyrite in Dolomte $.25 to $.50.

Ruby Blende xld $.25 to $1.00.

Fine Marcasite xld $.25 to $1.00.

Deep rose-colored Quartz $.10 to $.25.

Glassy Actinolite xld $.15 to $.35.

Polished Peristerite, large $.75.

Boryblawite, Mineral Wax, polished, new $1.25.

Large piece Lapis Lazuli $.85.

Fine xld Rhodocorsite $.50 to $2.00.

Xls Amazon Stone $.15 to $.40.

Xls Beryl $.20 to $1.00.

Xls Apatite $.15 to $.75.

Iridescent Hematite, Elba xls $.75 to $1.25.

Elegant xld Pyrites $.20 to $1.50.

Sioux Indian Relics, Cheyenne River Fossils, Sea Shells and Alumnium Goods.

Large Priced Catalog for Stamp.

Natural History Establishment of

L. W. STILWELL,

Deadwood, S. D.

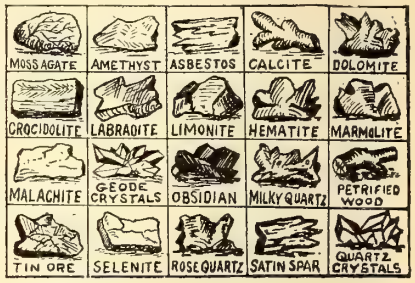
Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).

35 cents postpaid.



"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

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The largest and most complete stock in the world.

SYSTEMATIC COLLECTIONS, evenly covering the science of Mineralogy.

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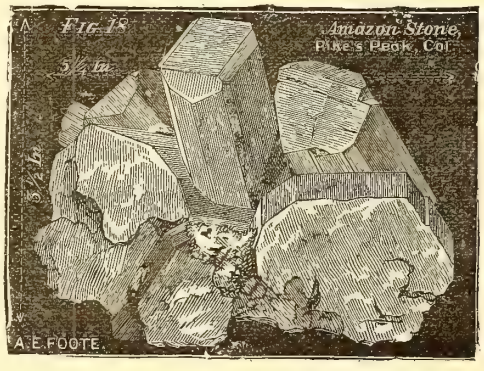
RARE AND CHOICE Cabinet Specimens for Museums and advanced collectors.

ESPECIAL ATTENTION is given to the selection of material for students and investigators in crystallography, microscopy, &c., &c.



Recent Additions to Stock.

CALCITE. In splendid scalenohedrons from one to eighteen inches in diameter, containing "*phantoms*" *of Marcasite*, some of the larger crystals showing tints of amethystine and honey-yellow color divided by lines of bright Marcasite crystals. 25c to $10.00.

ICELAND SPAR. Where particularly clear or finely colored material was found, we sacrificed crystallization and obtained from parts of large crystals, what are believed to be the most beautiful rhombs of Iceland Spar ever seen. They show perfect transparency save for the exquisite coloring of yellow and various amethyst shades, and the bands of brilliant spear-shaped Marcasite crystals.

The small cleavages at 10c. to 25c. are of quite as fine quality as the cabinet specimens of higher price and make a novel addition to the collection of microscopist or amateur.

Send for our complete list of new arrivals.

Price Lists and Circulars Free.

(In ordering book catalogues, mention the subject in which you are interested.)

"Catalogue of Minerals,"

fully illustrated, 128 pages, 10c; bound, 20c.

DIASPORE CRYSTALS.—All of the resent find made at Chester, Mass., was secured by us. Clear, violet-colored crystals of high lustre and perfect crystallization are implanted on the emery, making specimens of a type new to collectors. None have been found but the few taken out some months ago and our collector informs us that there is little chance of their being found again; $2.00 to $15.00.

Small groups and microscopic specimens, 50c to $1.50.

ZEOLITES FROM OREGON. A new locality rivaling Nova Scotia in the excellence of its *Chabazites, Stilbites, Natrolites, Thompsonites.* A large lot received, containing many beautiful specimens, the groups of Chabazite being especially noteworthy. Also Lorandite, Kylindrite, Caswellite, Emeralds, Onyx, Sphalerite, etc., etc. Boxes of minerals sent for examination.

Always mention NATURAL SCIENCE NEWS *when answering this ad.*

Natural Science News.

VOL. I ALBION, N. Y., JUNE 29, 1895. No. 22

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y,

Entered at Albion P. O. as 2nd class mail matter

Photography.

In the NEWS of May 25th, I noticed an article on photography, and, having a little different notion from the writer on some points, I concluded to give a few of my ideas on photography.

I liked the dark room very well, but think that Eikonogen developer, (a formula for the use of which is given by nearly every manufacturer of dry plates), is far ahead of pyro, and does not stain the hands, which does away with finger stalls or rubber mittens.

Blue paper does not bring out the detail very well, but makes very nice pictures from some negatives as he says. Gelatine papers are far ahead of Colodion papers, in my estimation, although it requires a little powdered alum, or some hardener in the fixing bath. A little Sulphite of Soda will keep the prints from bleaching out while fixing. Collodion paper has one very bad detriment which is the scaling off of the surface, and pictures are very easily spoiled in this way, even if kept in an album. Most of the collodion paper curls, which is also very bad in handling.

I only offer this as a little suggestion and would like to hear from others and get some ideas on this line of work.

J. W. WOLF
Garden City, Kans.

The Ice Age in Indiana.

When under the influence of more than arctic cold the inconceivably vast masses of ice accumulating upon the northern plateau moved southward they overwhelmed the Canadian Hills, then following the line of drainage they scooped out the river valleys into great lake-basins, and loaded with vast masses of debris invaded Indiana.

The glacier did not appear as a single stream, but rather as a number of mighty branches uniting into one vast ice sheet. The regions whence these various currents came are clearly indicated by the nature of the substance which they transported hither. In studying the surface of a limited range we may find in our collections granite and other crystalline rocks which we know must have come from the Canadian highland, fragments of the Water Lime and Corniferous Limestone with characteristic fossils from the islands of Lake Erie, rocks and fossils of the Hudson River Group of Canada north of Lake Ontario, and masses of native copper and greenstone (diabase) transported 400 or 500 miles from the copper series of Lake Superior. From the iron regions back of Marquette we have fragments of granite. slate and iron ore. From the north of the head of Lake Michigan and the islands in Lake Huron we have silicified corals and other fossils. In addition to these positively identified relics we have specimens of magnetic iron which probably came from the Laurentian series north of Lake Ontario and the St. Lawrence.

The blended streams from all the directions indicated by these fragments moved down over Indiana, crushing, tearing up and grinding to a powder the outcrop of the Paleozoic rocks, polishing, grooving and striating the surfaces over which they moved, and accumulating great quantities of debris, either borne on their crests or perished before their moving front.

The northern part of the state is traversed by a remarkable upheaval of the Upper Silurian strata. Beginning near the boundary of Ohio this line which is called the Wabash Arch, is best studied where it is laid bare by the Wabash river. It is also plainly traceable in Illinois, northwestward past Chicago, then to the volcanic region of Lake Superior, where it is probable the ancient disturbance originated of which this axis of upheaval is a projection.

The Wabash Arch probably modified the action of the glacier for a time, perhaps checked its progress temporarily and then the great ice sheet moved on. Ascending the elevated region in the east central part of the state, the so called "Alpine region of Indiana" it reached the Ohio river, sent a projecting spur into Kentucky, and then, its force spent and the terrific cold relaxing, it began to recede.

Its retreat was not sudden nor uniform, but like its advance was marked by variations and vicissitudes, and long struggles with the mightiest obstacle that had ever crossed its path, the Ohio river.

When the lobe of the glacier known as "Wright's dam" crossed the Ohio at Cincinnati the waters of the obstructed stream accumulated in the vast "Lake Ohio" to the depth of hundreds of feet. From time to time the ice front would yield to the pressure of the imprisoned water, and Southern Indiana would be overwhelmed by an inundation of frightful force and extent. This was repeated again and again until the recurring floods had left traces which are discernable to this day, but at last the ice front receded, quit the field.

Farther and farther north it drew, receding and advancing, back and forth like the swinging of a pendulum, but with oscillations enduring through centuries of time.

In its first advance the ice had overwhelmed a flora far more luxuriant than has since flourished in this region, utterly obliterating it in some places and in others burying great accumulations of vegetable matter beneath mountainous heaps of bowlder clay and gravel. A fauna too, richer in genera and species than that of the present and containing larger forms than any now lying on earth had been driven out or exterminated, leaving the remains of many of its members hidden beneath debris and till.

The innumerable basins scooped out by the advancing ice sheet

were left, when it receded, filled with slowly melting ice over which the currents from the melting glacier flowed in torrents, depositing clay and sand more or less perfectly stratified and dotting these strata of finer materials with bowlders dropped from icebergs.

An arctic flora crowded close upon the receding ice front, and following this came the plants and animals of the temperate zone. Centuries, thousands of years, went by, arctic cold again returned, and again the glacier pressed southward. In many places it inpinged its first deposit, producing what is called *Contorted Drift*, in others it tore up the debris left on its former visit, and ground out the autograph first graven on the rocks. In still other places it spared the former deposits, no doubt finding the till frozen hard as adamant, more difficult to erode than the native rock had been. Often where the unyielding till held bowlders imbedded in its surface the returning ice instead of removing them would truncate and plane down their upper surface, leaving them marked with fresh furrows, grooves and striæ.

The vegetation was again overwhelmed, but not altogether removed from sheltered valleys it was left buried beneath glacial debris. The buried remains of these interglacial marshes and forests are now found compressed between layers of impenetrable clay, and reduced to about the appearance of peat bogs. The nature of these deposits is unmistakable and they are called "swamps" by well diggers.

In one place in Boone county a swamp 12 feet in thickness was found and beneath a glacial deposit 46 feet thick. In another place in the same county the swamp was reached at a depth of 60 feet, and a third excavation revealed a cedar tree buried 100 feet deep. Black muck, filled with leaves, twigs and branches of trees has been found at varying depths over a large part of the state.

Vegetable, and sometimes animal remains buried in such large quantities in impenetrable clay could not fail to produce gas, just as submerged vegetation produces gas in surface marshes. The imprisoned gas escaping when the clay is pierced, is naturally of limited quantity, and the flow is of short duration, yet it has often been sufficient to awaken wild hopes that it might be an indication of inexhaustable quantities beneath.

The lake basins, scooped out by the glacier on it former visit, and left filled with ice and sand on its retreat, were again traversed by the ice field and buried deep with the till, so that when left again they were lenticular beds of wet sand enveloped in dense clay. These are the underground lakes and pockets of water found in many localities, and the source of many of our mineral and artesian springs.

The water from such artesian wells or springs are often charged with organic matter from the decay of interglacial forests, and with hydrous peroxide of iron from the bog iron formed in these deposits. The decomposing vegetable matter sets free organic acids which act on the salts of iron occurring in the drift clay with which it is surrounded, thereby rendering them soluble. This iron held in solution as a ferrous carbonate oxidizes when exposed to the air and is thrown down as hydrated peroxide, a compound which gives "local color" to the neighborhood of mineral springs in the drift region.

As the glacier slowly and irregularly retreated the water from the melting ice took a prominent part in the configuration of the surface of the country. Sands and gravels are known to have a strange tendency to shape themselves in mounds and winding ridges under the influence of currents, and while the surface was still partly covered by an irregular sheet of ice conflicting currents, breaking through gaps in its front and forcing their way towards the channel of drainage swept away, drifted and whirled the loose detritus into the forms which are the most unmistakable indications of the former existence of glaciers and glacial streams. Among these are the eskers, long, narrow, sharp ridges of gravel and sand, mingled with bowlders of Niagara limestone thrown up in lines parallel with the lines of ice movement or drainage.

More noticeable still are the kames, the rounded hills or elongated ridges terminating in hemispherical mounds, or having a mound in the middle and sloping symmetrically to the ends. These mounds and ridges, formed by some imperfectly understood conflict of currents, and so well known as the mementoes of the retreating glacier, are sometimes mistaken by ill informed people for the artificial mounds and fortifications of the "mound builders."

When in its final retreat the glacier reached the northern part of the state the Wabash Arch again become powerful in modifying its action, turning aside the glacial torrents and restraining the floods with their attendant debris and bowlder laden icebergs from sweeping with their force over the, south, thus increasing the depth of the accumulations in the north.

At length as the great Ice Age neared its close and the glacier retreated into Canada the surface of the state began to assume its modern aspect. Still for a long time Lake Erie poured its waters, by way of the Maumee, through the Wabash, and the Wabash, winding along the northern side of the morainic dam and finally forcing its passage to the south-west, flowed over a wide expanse of country, leaving evidences of its eroding and sorting power on the sides of hills miles from its present channel.

When at length their northern outlets were freed the waters of the lakes receded and the Wabash shrank to its present proportions. Lake Michigan withdrew from its old shore lines, leaving wave washed terraces to show where it had been, and laying bare the broad "sand barrens" which cover the north-western corner of the state.

In northern Indiana beautful little lakes are still numerous in the hollows scooped out by the ice, but the extensive system of shallow lakes which once dotted other parts of the state were drained by natural agencies, and left in their places "prairies" showing lacustrine deposits, but destitute of shells, except diatoms.

For thousands of years the elements have labored to efface all traces of the ice age, but in vain. Evidences of its work are to be seen on every hand. Every excavation and railroad cutting reveals its sign manual on the grooved and striated rocks. The high ground everywhere is cut through by the wide, deep channels of glacial torrents now traversed by little streams wholly inadequate to erode the gorges in which they flow.

The moraines, in spite of time, are still lofty ridges crowned with "dykes" of granite bowlders. Bowlders of granite, gneiss and greenstone strew the ground, and in many places become serious obstacles to cultivation, though this evil is often turned to good account

by utilizing them as material for foundations or for fences. Drift gravel, too is largely utilized, and the roads of the state, at least the best of them, are gravelled with pebbles which were brought hundreds of miles by the glacier.

ANGUS GAINES,
Vincinnes, Ind.

Eye-Stones and Mad-Stones.

In the course of our lives we hear a good deal regarding eye-stones and mad-stones, but comparatively few persons know what they are, how they are used, or where they come from. Queer old stories hang round these mysterious substances, and of course the tales grow until we hardly know what to believe. For instance one man informed me that a very old and valuable eye-stone in his family, had cured two cases of blindness, and it is quite a common thing to read accounts of people being saved from that dread disease hydrophobia by the application of a mad-stone to the wound made by the rabid dog's teeth. People are very apt to be credulous, even in this enlightened age, as they have been in past ages. As I have made something of a study of these vaunted, yet interesting objects, a few notes may not come amiss to my readers, as they show the fallacy of some of the ridiculous notions generally held.

When I was a boy, a man showed me an eye-stone which he claimed had been in his family for several generations and which would work wonders in all eye troubles; allaying irritations removing foreign bodies from the eye or under the lids, and curing blindness, cataracts, etc., to the end of the chapter. In truth, all eye-doctors might as well go out of business when that stone was in the neigborhood, for its powers were far reaching and not to be disputed.

Of course I believed him implicitly, for boys are credulous, particularly regarding articles of great pecuniary value, and I looked on this precious article with greater veneration than a diamond or other jewel could have possibly impressed me. And when my adult acquaintance maintained that the stone was alive, of course I believed him. For why should not a boy believe as strongly as a man, and my acquaintance believed in the life of this wonderful stone. To convince me, he took the little eye-stone and dropped it into a dish of vinegar, when, after a few minutes it awakened from its sleep and began to slide about the bottom in a jerky sort of way. But the man could tell me nothing more. He only knew that the stone was very valuable, and that money would not buy it, and that it could cure blindness. He did not know what it was, or where it came from. In fact he knew just as much as his grandmother, and no more, and three generations had not helped his family for knowledge in this respect.

Later, I saw the eye-stones work, often with benefit to the patient. They are little flat stones apparently: white or nearly so, flat on one side and rounded, that is, convex on the other and shaped somewhat like the half of a split pea, but much more flattened. If a person has a cinder in the eye and it cannot be readily removed, the eye-stone should be introduced under the upper eyelid at the inner corner or angle of the eye. Then the eye-stone will be shortly found to have passed to the outer corner, and it will naturally have the foreign body with it.

Of course the stone moves through the action of the eyelid muscles; but the ignorant credit the inanimate substance with life, and idle stories continue to grow and be repeated by those who are given to stretching the truth, and who do not investigate.

On one occasion in the winter, on the Eastern coast of Florida, during a storm, thousands of these little eye-stones were washed upon the beach, and we gathered all we wished, of sizes ranging from a very small split pea to nearly that of a quarter of a dollar, and if they could be sold for a dollar each instead of $1,000, I would spend my entire time gathering them from the seashore. Then the subject was looked up more fully, and it proved that the eye-stone is simply the operculum from the shells of the family *Turbinidæ* and that there are undoubtly millions of them lining our sea coast.

The * operculum is that portion of the animal which enables it to close its shell to its enemies and thus protect itself against invasion, and is a singular and useful arrangement which is attached to the muscles of its locomotive apparatus; so said.

* Many shells are provided with this useful arrangement. The lid as it is called is of various forms in the different species. The Whelk is provided with an operculum.

In order to satisfy myself regarding the power of vinegar to move them, a number of the opercula were placed in a vessel containing strong vinegar, when the movements which had surprised me as a boy, fully thirty years ago, were repeated. Of course the idea that the eye-stones were alive, had long since given away to mature reasoning, and I was anxious to find the cause of the irregular, jerky movements. Several were left in the vinegar over night, when considerable roughness was apparent on the surface, and after a few days they showed signs of much corrosion. This indicated that the acid in the vinegar worked on the shell. Procuring some strong acetic acid, which is the chief factor in vinegar, an operculum was dropped into it, when the acid ate into the calcareous substance and entirely consumed it within less than forty-eight hours. This convinced me that the movements of the ignorantly credited live stone were caused entirely through chemical action.

Regarding the value of eye-stones, I will not pretend to speak with knowledge, but do not doubt that they are serviceable at times in relieving suffering by their power to assist in the removal of foreign substances from beneath the eye-lids. Still when I tell you that two ophthalmologists of the modern school did not know what the eye-stones were when I showed them some, rather indicates that these priceless (?) articles have rather dropped out of the sphere of recent eye-doctor's practice.

Of mad-stones there is a great variety; and it is a fact that I have never seen two just alike unless they were manufactured or mined by the same person. However they are all alike, in that they are light and porous and possess the power of absorbing moisture. All that have come under my notice, whether drab, buff-colored, reddish or yellowish, possessed the quality of adhering to the flesh when the skin was moistened. As soon as the moisture was absorbed the clay (mad-stone) fell from its hold.

East Indian mad-stones, that I have seen, are of a diameter of two inches or less, rounded, flattened and of about one quarter of an inch in thickness or less. Fabulous prices have been paid for these supposed preservers of men's lives, and many of them are made

or mined and sold each year to ignorant believers in their efficacy. The truth is, this vaunted Oriental trash is probably no better than the stuff sold for mad-stones in America, or any other country, but the fakirs of the Eastern countries are very smooth and have gained much credit, whether deservedly or dishonestly, you are left to judge. Let us suppose a case:

A common tourist sees a man bitten, or more likely sees the man after he is bitten. He may not have seen the snake, and if he does he does not know the species and whether it is a noxious kind or not. The natives may not know themselves whether the snake is poisonous, but in a country like India where there are so many deadly species, nearly all snakes are considered poisonous. The tourist is at least told that the snake was one of the most deadly kind. He sees the mad-stone applied, fall off, and the man recover. Then that tourist marvels much, and writes up a great lingo to the English and American papers of the marvelous powers of the Oriental Mad-stone.

The facts are about like this. Assertions if you wish to call them so. for I only claim and cannot prove. If a large Cobra di capello or a full-sized Diamond Rattler sticks his half inch fangs into the meaty part of one's calf or thigh, and injects the poison into the wound, then all the snake-stones or suction pumps in the world are of little avail.

If I might suggest it, the best means of combating an accident of this nature would be to cord the limb, if possible, above the wound and then have continued suction applied by the mouth. While your companion is performing these necessary acts, you should drink copious draughts of whiskey. If you have no companion or whiskey, write a note to your friends, say your prayers and *pass in your checks.*

About ten years ago some one in Virginia advertised first-class mad-stones; warranted to cure anything from a flea bite to a case of hydrophobia in no time. The prices ranged from $5 to $100, according to size, and as I was rather skeptical it was not thought best to invest too heavily. So I corresponded and at last secured a $10 chunk of yellowish-red porous light-weight stone, of irregular shape, for $2 in exchange. Business was not very good for that dealer and so you see I beat him down, which is not according to my usual custom. But it is well no more was invested, and I am not at all sure but that if too much eagerness was not shown I might have secured a $100 chunk for 50 cents.

On my first trip to Florida the stone accompanied me, and I was constantly on the lookout for someone who was bitten. Of course the wish was not expressed that some one should luckily be struck by a rattler. Still I felt much like the good little Sunday-school boy who goes to see the balloon ascension and *legalized criminal* parachute drop, and "kind o' hopes sumthin exciting will happen." But it never happened when I was about. In truth the small boys as well as men run about in woods and scrub more freely than they do at the North.

So the mad-stone (clay) was applied to flea-bites, mosquito bumps and sand-fly punctures, and it may be stated that if one had enough of mad-stones to fit the parts affected, and friends to apply them, why the scheme worked well. The trouble was, that while one was working on one damaged spot, ten other insects would attack other portions of uncovered cuticle. This is difficult to believe by some, but those who have visited certain portions south of the 27th parallel will acknowledge the accuracy of the assertion. So I re-attired myself in my covering of thick netting and kept the "pesky varments" off with a palm leaf.

In the case of a bee-sting the stone was undoubtedly beneficial, and as well with hornet stings, but the effect was not nearly so quick or thorough as in the results obtained from the soft clay mixed with water and applied as every boy knows how. So I gave my stone to a native who firmly believes in the *sartin deadly natur of every snaik,* and I doubt not that he has saved dozens of lives with it; that is acccording to his story.

Of course the name mad-stone is given to these supposed preservvers because they are believed to remove the virus from the wound made by rabid dog's bite. As a matter of fact, it is much more difficult to combat the effects of a rabid dog's bite, than to treat the wound made by a poisonous snake. Many a case of poisoning by snakes has been saved by judicious treatment, and not rarely one quickly recovers without treatment of any kind. But no authenticated case of developed hydrophobia has ever been successfully treated and saved that I can learn of. The poison in dog bite is much slower to act, and its presence is not known for from a few days or weeks to over a year.

Considering the great number of dog bites that are harmless, and the gullability of those who are bitten, and their readiness to believe in any cure-all, it is easy to understand how mad-stones readily become prized articles in most any neighborhood. When my readers are informed that out of 20,000 dog bites, not one will probably prove fatal from virus, it can be readily understood that hydrophobia is a rare disease in man.

Still in a neigborhood where there was a mad-dog scare, a man with a lot of mad-stones could make a barrel of money in quick order by playing on the credulity of the citizens.

MORRIS GIBBS,
Kalamazoo.

Relics of the Great Auk.

At Steven's salesrooms yesterday the skin of a Great Auk, a bird believed to be extinct, was offered from the collection of Sir Frederick Milner, M. P. The specimen in question is believed to have come either from the Orkneys or from the coast of Ireland, and is guaranteed genuine to a feather. There are about eighty known skins, and only twenty-four of these are in Great Britain, ten being in museums and fourteen in private hands. The bidding started at 100 guineas, and slowly rose to 350 guineas. As, however, the reserve price was not reached, the specimen did not change hands. It is believed the bird will eventually go to one of our museums. At the same sale an egg of the Great Auk was offered. Other specimens have fetched as much as 300 and 260 guineas, but that in the market yesterday, though the bidding started at 100 guineas, only reached 180 guineas, at which price it was bought for a private museum in the neighborhood of Regent's Park.—*London Times.*

Mr. A. E. Colburn, Taxidermist, of Washington, D.C. recently purchased an American Otter in the meat. The Otter was taken in Anacostia River or Eastern Branch of the Potomac, within sight of the National Capitol.

The copyrights on the books of Prof. Asa Gray, the celebrated botanist, yielded $3,067.44 last year, and the popularity of his works as text-books and general authorities seems to have increased steadily since his death several years ago.

PUBLISHER'S DEPARTMENT.

Teachers

Contemplating a trip to Denver, to attend the Convention of the National Educational Association, in July, will have all their traveling troubles bourne, and wants looked after by an agent in charge, if they will join the special excursion, arranged for by Mr. C. W. Bardeen, Syracuse, N. Y., the Committee on Transportation for Western New York. They will also secure the lowest rates, the finest accomodations, the quickest time, and the best meals.

This special train will leave Syracuse at 4:00 p. M., and Buffalo at 8:00 p. m., on July 3rd, and arrive at Denver at 5:30 p. m., on July 5th. It will be composed of the finest sleeping cars, and will be run via the West Shore, Nickel Plate Road, and the North-Western, Union Pacific Route.

Special rates have been authorized by all lines to Syracuse and return on the occasion of the Convention of the State Educational Association, July 1st, 2d and 3d. All teachers in New York State are requested to attend this Convention at Syracuse, and to join the special party for Denver, leaving at 4:00 p. m. July 3d.

Teachers purchasing tickets via the West Shore R. R. from points east of Syracuse, to the Denver Convention, will be allowed a stop over at Syracuse to attend the State Convention.

For all particulars as to rates, diverse routes, sleeping car reservations, etc., etc., write C. W. Bardeen, Chairman Transportation Committee, Syracuse, N. Y., or F. J. Moore, General Agent, Nickel Plate Road, Buffalo, N. Y.

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Ancient stone relics from Southern States Sale.

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Many of the subscribers of Natural Science News write that they failed to receive the copy of my June Naturalist's Bulletin which I mailed them. Others write that they are fearful that their copy will arrive too late to be of benefit to them. If You can be included in either of these classes, please advise me by return mail and I will grant a special dispensation to cover your case. It is my endeavor to treat all of my patrons fairly and with impartiality, but it is an unquestionable fact that many of those June Bulletins never reached their distination.

Faithfully,

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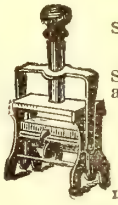

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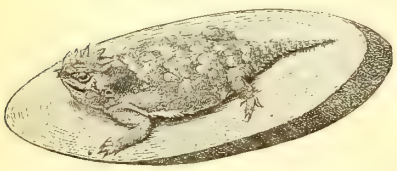
Phrynosoma.



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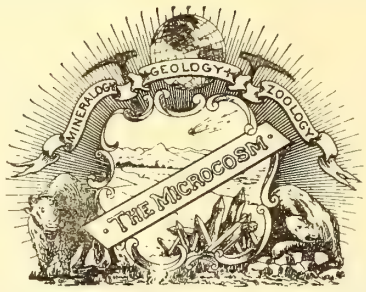

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Albion	7:00	9:10	11:35	3:25	6:50		11:06
Lockport	8:05	10:05	12.22	4:20	7:40		12:00
Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20		12:35
Niagara Falls.	9:06	10:50	1:10	5:10	8:30		12:45
Buffalo.....	8:55	10:55	1:25	5:15	8:45		

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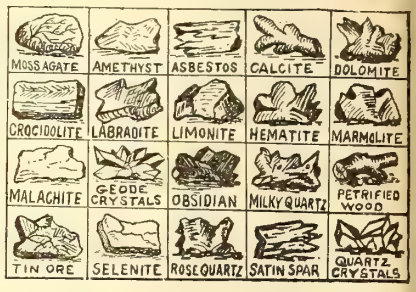

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Natural Science News.

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Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
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Florida Pitcher Plant.

By Charles B. Palmer, A. M.,
Columbus, O.

Among the many curious and interesting objects which came under my notice during a residence of several years in Florida, none interested me more than an insectivorous plant (*Saracenia variolaris*) which is common about Orange Heights, in eastern Alachua County. I have no reason to suppose that it is limited to this locality, but this is the only place in which I have observed it. It is a modest plant, seven or eight inches in height, growing in damp situations among toe coarse grass of the pine woods.

It bears a single radical flower, the most striking feature of which is the style, which expands into a broad umbrella, entirely enclosing the flower. But it is not of the flower, but of the pitcher-like leaf that I wish to speak.

When the young leaf first makes its appearance, it is spatulate in form, with a simple notch on one side near the end, ranging upward at an angle of about 45 degrees. At the same time the end of the spatula enlarges into a dome-shaped hood, the upper lip at the opening well forward and downward over the lower. The tube is largest at the top, narrowing gradually to a point a short distance above the ground. The front or open side of the tube has a narrow rib; the rest of the circumference being round and smooth.

Being unable to find in botanical literature any adequate account of the manner in which this plant performs its remarkable functions of catching and devouring insects, I was led to make the study myself. Placing several of the plants in flower-pots for continuous observation, dissecting numbers of others in the woods almost daily, and continuing these observations during several different seasons, the little pitcher has come to seem like a familiar frieud, and has yielded me an amout of pleasure and satisfaction that would seem incredible to any but a lover of nature:

If one were to say that he had seen a tree which could catch and eat squirrels, rabbits, field-mice, etc.; he would be set down as a bungling imitator of the celebrated Baron; but here is a frail plant which we tread upon unnoticed, that actually captures, devours, and digests a number of animals endowed with much greater activity, and doubtless with higher powers of perception, than any mammal.

If the plant has any odor attractive to insects it is not perceptible to human olfactories. But when near the opening they seem possessed with a desire to enter, and the way is open and easy. At the edge of the opening they are seen to sip a secretion of the plant, and immediately hasten on to the interior. Here some of them will continue to eat ravenously until they are seized with a sort of palsy, causing them to tremble violently, release their hold, and fall into the liquid at the bottom of the tube. Others, after entering the dome, become frightened and endeavor to escape. And here is discovered one of the remarkable features of the plant—an arrangement clearly intended to deceive the unlucky prisoner. The hood projecting over the opening forms a dark background, while the opposite side of the dome is brilliantly lighted by means of more than a hundred transparent spots or windows. Just as a bird which has entered a room by a dark passage, beats against the window-pane, so the poor insect exhausts his strength at the windows of his prison, and finally fails exhausted—literally "in the soup."

The bath seems to cure the palsy, for they invariably struggle vigorously to escape by climbing up the side of the tube. But the effort is vain. It seems remarkable that insects which walk upon glass and other smooth surfaces at will can make no progress here. The inner surface of the tube has a wonderfully smooth feel, and under the microscope is seen to be covered with very fine hairs forming a nap in the downward direction. About half-way up the tube there is a change in the appearance. It looks as if the lower part were wet and the upper dry, but the microscope shows that the appearance is caused by a different arrangement of the hairs on the surface. On the upper half, they appear like bundles of grain with the ends well spread. The purpose of this arrangement is not apparent; but having on one occasion found a larva at the halfway point, it occurred to me that possibly certain species had feet able to traverse the lower half, and such would be stopped by the different arrangement above. However this may be, the insect which enters this doubly and trebly guarded prison "leaves hope behind." Even when rescued he seems unable to resist the temptation to taste again the insidious nectar which leads him to his doom. Cut away the hood, and let a blade of gtass down into the tube. A half-dead fly climbs eagerly out. Too weak to fly, he can be handled at will. Place him on the outside of the tube: an inch or more from the opening, with head turned away from danger. He staggers forward a few steps, stops and considers, then like the confirmed toper in front of a saloon, turns around and goes back for one more drink. At the first taste he becomes crazed, sips ravenously till the tremens comes on, and drops him down to certain death.

The number and variety of insects disposed of by a single plant is astonishing. Every order is represented. One would think that a grasshopper, large enough ts reach across the tube and almost close it up with his body and long legs, would have small excuse for being in such a place. But there

he is slowly dissolving. Beetles, moths, larvæ of numerous kinds, including large woolly caterpillars, all go the same way. The hymenoptera are represented by ants, but I have never found any species of bee, though I have searched diligently for that special purpose.

The statements of certain botanists that the pitchers are "half-filled with water containing drowned insects," and "that it is difficult to believe that they have any connection with the economy of the plant," need revising. A chemical analysis of the fluid is wanting, but it is a secretion of the plant and not rain-water. The construction of the plant makes it impossible for rain to enter. Furthermore, I have seen a plant which had been cut off at the root send up a new leaf, mature its pitcher, secrete its fluid, and begin business, during a period in which no rain had fallen.

In every healthy pitcher may be found insects still alive and struggling; others dead; others further down in the mass, coarsely broken up; and at the bottom only a pulp. The fact that the elytra, mandibles and other hard parts of beetles, are dissolved with the rest, shows that the plant has remarkable digestive powers. Unlike animals, it has no means of rejectfng unsuitable portions of food. Everything goes. The front door is always open, there is no back door, all sorts of visitors enter, none escape, every shred disappears.—*Science.*

A Recent Addition to the Agassiz Museum.

There has been placed very recently in the Agassiz Museum of Cambridge the beginning of a collection of birds, the gift of Mr. William E. D. Scott, of Cambridge. As yet the collection numbers only 56 cases, containing about 250 speimens—not large as public collections go, but shown as a beginning of a museum of birds which it is hoped will some day surpass in interest and curiosity anything of the sort in the world.

In each case are two or more birds beautifully prepared and very nicely mounted in life-like attitudes; not on plain wooden bases, as in most museums, but perched on the limbs and twigs of trees and bushes, clinging to the bark, or standing on a natural base of mossy stones.

The cases themselves are not of the ordinary kind; each is set flush with the wall, a separate cabinet being devoted to each species.

The collection thus far is to illustrate a single point of ornithology—the color of the plumage as influenced by sex, by age, by the season of the year, by geographical distribution or by mere freakishness of nature; or—a point quite as important—as remaining uninfluenced by the same conditions. The point illustrated is fully explained in the label attached to each case. Under a case of Screech Owls (*M. asio*) the label reads as follows:

"The upper bird of this group is an adult female taken at Pocantico Hills, Westchester Co., N. Y. in the breeding season. The lower bird is an adult female taken in October at Tarpon Springs, Florida. This is an example of a now migratory bird ranging over a large area. The different environment of individuals widely separated has produced birds apparently scientifically distinct, there being in this case a very marked difference in size. A series of Screech Owls collected along the Atlantic sea-board at various localities, would show a gradual change from one extreme to the other. The Florida Screech Owl is recognized as a geographical race of the common Screech Owl."

The influence of sex is shown by a dozen or more cases—a pair of Am. Eiders regarding each other from the rocks which form their base as naturally as if in their native elements; two Bluebirds bringing material for their nest in the hollow of a decayed limb (rather an unusual sight this year) and so on through a familiar list of our common birds. Three Robins show the effect of the summer and winter in toning down the bright red breast of spring.

A little farther on four Scarlet Tanagers, all adult males, show individual variations in the shade of their glowing plumage. Next dichromatism or a difference not merely in shade but in the basic color itself, is illustrated by a Screech Owl mottled grey, and another mottled red.

A still more striking example of this same dichromatism is in a large case of 15 Blue Herons shot at any time you please and ranging in age from young to old, but in color varying from pure white through white pied with dark blue to pure dark blue. The next case shows a pair of Stort-tailed Hawks of the same sex, but one with a pure white the other with a rich dark brown breast.

Then several groups of Albinos are shown—an Albino Mocking Bird and an Albino Meadowlark, each of these extravaganzas being accompanied by a bird of normal plumage. A case of Cottontree Sparrows from Jamaca show the effect of age; their plumage varying from olive to dead black. Three Snowy Herons show the development of additional plumage—a young one clad in simple white, but his older relative bearing on the crest, the wings and the breast; the beautiful plumes one sees so often used for millinery purposes.

Then come a dozen or more cases filled with specimens that do not vary in their plumage. A case of Chickadees in this class is the most striking and lifelike. Another case contains several "Scott's Rails"—a bird first made known to science by Mr. Scott while collecting about 20 years ago on the gulf coast of Florida.

Such in brief is the scientific intention of this collection. The skins are a gift of Mr. Scott, who also raised the needed money to mount and case them. He is very enthusiastic over the possibilities of a museum of ornithology built up on the same vivid and natural plan as the 56 cases already prepared.

In another room, for example, he would show the mental abilities displayed by birds in another, the birds of New England, then those of North America, and finally those of the world. $100,000 would be none too much to build a museum of this kind which should surpass any in the world.

In the meantime the friends of the Agassiz Museum hope to secure a sum of money each year which will enable Mr. Scott to go on making his collection as complete as possible, and it must be remembered, even in the small room in which it is now exhibited, it is the most perfect in the country.

Arthur W. Kirkpatrick,
Boston, Mass.

Prof. Huxley.

Thomas Henry Huxley, LL.D., Ph. D., D. C. L., M. D., F. C. S. Eng., F.R. S., died at Eastbourne at 3:40 p. m., June 29th. He was born on May 4, 1825, at Ealing, Middlesex, and was for some years

educated at the school in his native place, where his father was one of the masters. This preparatory course was followed by industrious private study, including German scientific literature, and medical instruction received from a brother-in-law, who was a physician. Afterwards he attended lectures at the Medical School of the Charing Cross Hospital.

In 1845 he passed the first examination for the degree of M. D. at the University of London, and took honors in physiology. Having passed the requisite examination he was, in 1846, appointed assistant surgeon of H. M. S. Victory for service at Haslay Hospital. His next appointment was as assistant surgeon to H. M. S. Rattlesnake, and he spent the greater part of the time, from 1847 to 1850, off the eastern and northern coasts of Australia.

In 1858 he was appointed Croonian lecturer to the Royal Society, when he chose for his subject the "Theory of the Vertebrate Skull." In 1859 his large work on "The Ocean Hydrozoa; a Description of the Calycopohoridae and Physophoridae," observed during his voyage, with illustrative plates, was published by the Royal Society. When, in 1860, it became Prosessor Huxley's duty to give one of the courses of lectures to the workingmen in Jermyn street, he selected for his subject "The Relation of Man to the Lower Animals." The questions arising out of this topic became the subject of warm controversy at the meeting of the British association in that and subsequent years.

He was elected lord rector of Aberdeen University for three years December 14, 1872, and installed February 27, 1874. In 1873 he was elected secretary of the Royal Society. During Professor Wyville Thompson's absence with the Challenger expedition, Professor Huxley acted as his substitute as professor of natural history at the University of Edinburgh in the summer sessions of 1875 and 1876. In the latter year he received the Wollaston medal of the Geological Society. He had received the honorary degree of Ph. D. from the University of Breslau, M. D. from the University of Wurzburg, LL. D. from the Universities of Edinburgh, Dublin (1878), and Cambridge (1879), D. C. L. from the University of Oxford (1885), and he was elected a fellow of the Royal College of Surgeons in 1884.

He delivered the Rede lecture at Cambridge, June 12, 1883, the subject being "The Origin of the Existing Forms of Animal Life—Construction or Evolution." In 1885 Professor Huxley resigned his offlcial duties, including the inspectorship of fisheries and the presidency of the Royal Society. Professor Huxley was well known as a writer on natural science, being the author of numerous papers published in the Transactions and Journals of the Royal, the Linnean, the Geological and the Zoological Societies, and in the Memoirs of the Geological Survey of Great Britain. In addition to the works mentioned above he had written "Lessons in Elementary Physiology," 1866; and many subsequent editions; "An Introduction to the Classification of Animals," 1869, etc.

Preserving Sea Weeds.

The following recipe is recommended by Dr. J. P. Lotsy for preserving examples of Florldeæ for microscopic examination: "The specimen is first laid in a 1 per cent solution of chrome alum in sea water and kept there for a period varying from one to twenty-four hours, according to the size and texture of the species. The chrome alum is then completely washed out and the specimen placed in a mixture 5 ccm. of 96 per cent of alcohol in 100 ccm. of water and vigorously stirred. The amount of alcohol is then increased by increments of 5 ccm. every quarter of an hour until it amounts to 50 ccm. The specimen is then removed and placed in a mixture of 25 per cent alcohol in distilled water, and the quantity of alcohol again increased in the same way, till it amounts to 50 ccm. alcohol to 100 ccm. of water. The same process is again repeated with 50, 60, 70, 80, and 90 per cent solutions of alcohol in distilled water: the specimen being finally preserved in the last."—*Scientific American.*

The Strangest Insect in the World.

The aweto, as the Maoris or natives of New Zealand call it, or *Hipialis virescens*, as naturalists term it, is found in New Zealand, and is a vegetable caterpillar of from three to four inches in length, and, so far, science has not been able to say whether it is a vegetable or an insect. It is always found at the foot of large myrtle trees that have beautiful red flowers on their stems, and a beautiful creeping clematis as white as the snow. The Maoris call this tree by the name of rata. The aweto buries itself among the roots of the rata, a few inches below the ground, and there lives until it is full grown, when it undergoes a most wonderful change. The spore of a vegetable fungus, termed by naturalists *Sophæria robertsii*, fastens itself to the neck of the caterpiller, just between the head and the first ring, and then grows upward to the height of from six to eight inches.

Many people assert that there is never more than one stem, but such is not the case, for some have been found with two stems, although very rarely. The stem shoots up out of the ground, above where the caterpillar is living, about two or three inches; below the earth it grows into the aweto, until it fills up every possible space within the outer skin without changing the form of the insect in the slightest way whatsoever, but simply substituting a vegetable matter for animal matter. As soon as this takes place both the plant and the caterpillar become dry and hard and die, but retain exactly the same form as when alive. The whole has a brown color, and the insect appears a wooden caterpillar, with a huge horn standing up from the back of its neck.

How the caterpillar manages to propagate its species no one can tell. Usually the caterpillar becomes a chrysalis, the chrysalis changes into a moth, the moth lays eggs, and these eggs again become caterpillars, and so on without stopping. Many reasons are given why the plant shoots up from the back of the neck of the aweto. One is that the aweto has a slimy substance oozing from its neck, which, while the aweto is boring at the foot of the rata tree for its only food, catches the seed of the fungus and holds it fast there till the latter begins to grow. When it has sucked all the vegetable life out of the aweto it must naturally die, for it finds no further nourishment. The aweto is often found in large numbers.—*Public Opinion.*

Dakota's Shell Mounds.

Twin Hills on the Prairies Made Up of Oyster Shells.

In the south central portion of North Dakota lies a butte, or mountain, which is a wonderful relic of an ancient era when the ocean covered the state. It is really two buttes, 200 or more feet in height, which are composed of little else than oyster shells. They are in the extreme southwestern part of Logan county, about 75 miles southwest of this city, and probably 35 miles east of the Missouri river. The base of the butte, which at a height of about 100 feet is divided and forms two peaks, each about 100 feet high, is about three-quarters of a mile in length, oblong in shape and lies extended in a northeastern and southwestern direction. The sides are precipitous, except at the southern extremity, where it is possible to drive part way up.

The butte lies in a region almost entirely settled by Russians, and none, so far as could be learned, has even visited it or even given it a name. It is a conspicuous landmark, visible for miles in every direction, as it towers above the surrounding rolling prairie and the valley of the Beaver—a tributary of the Missouri river—near which it is located. Very little vegetation is found on the butte besides prickly pear and in favored spots bunches of grass. The northern end of the butte, which has borne the brunt of wind and rain for numberless centuries, is scarred and eaten away and presents almost vertical walls to the northwest winds. Here and there on its face are huge blocks of the cemented shells, which form a kind of rock, which from a distance appears ready to fall outward and downward with a crash. The jutting crags and rocks make a wild and picturesque sight.

The southern peak, which can only be surmounted after a stiff climb, is nearly flat on top, oval in contour, and nothing is visible on the surface but oyster shells, some of them whole, as though just opened of their contents, some crumbling to dust, as though extremely old, while on every hand are broken shells of all sizes. An excavation on the surface reveals naught but more shells and a slight intermixture of gravel.

The other peak is somewhat different in character and contour, though this, like the other, is composed of nothing but shells. It is rougher, and the shells seem to have been united into a kind of rock which defies the wind and weather. This is separated from the butte by a huge block 10 or 12 feet square and is almost as true a cube in general outline as though the hammer and wedge of the stonecutter had fashioned it. Here and there, projecting from the sides, are at intervals large shells which countless frosts have failed to loosen. A small cave has been discovered in the side of this peak. Shells form its roof, its sides and its floor The butte is isolated, with no hills approaching it in height to be seen in any direction for miles.—Jamestown (N. D.) Letter in Minneapolis Journal.

A Family of Bonasa umbellus.

Date, May 27, 1895. Time 6:55 p. m. Place, mixed deciduous and evergreen woods, with grass and ferns in patches. I had eaten my supper and was out for a few minutes with the birds before dark. Having travelled half through a strip of woodland, about one and one-half miles from the village of Gaines, I came to a place where the woods were divided by an old tumble down rail fence just beyond which was an opening grown up to brush, etc. I was looking high for small birds, when I was startled by a commotion on the ground in front *and what a commotion!* Almost under my feet was a male Ruffed Grouse, not putting distance between himself and I at the rate of 100 miles an hour, more or less, as is usually the case; but running towards me; every feather erect, ruff spread to its greatest extent, and crest erect. And such a racket from one of our stillest birds. He clucked and hissed, sputtered and cackled, in fact it was a perfect miniature of the common hen's performance under like conditions except for a peculiar whistling note which I was surprised to hear from this bird. But why all this fuss? From one point in the dry leaves just ahead ran a group of downy balls, not in one direction but each one in a separate course like the spokes of a wheel. But suddenly all this changed. Mr. Grouse discovers that he confronts what he rightfully regards as his worst enemy, man. His feathers drop and with a warning cluck he flies a few feet over the fence. Presto, every downy chick has disappeared. I did not dare to stir for, surely, at least two of the little birds must be close to my feet for I saw them run that way. They did not seem to try to escape from any definite danger, for they ran in every direction with a perfect disregard as to my position. Evidently they simply followed a "blind" instinct prompted by the warning note of the old bird. I looked the ground over closely and finally discerned two sparkling eyes viewing me with the same unblinking steadiness that the old birds have always been noted for. Colored almost exactly like the dead leaves on which it sat, it was almost obliterated in its surroundings. Looking closely at the ground that I might avoid stepping on another one I stepped forward and picked it up. On straightening up, my eyes fell on another one and so on until I had seven in my hands. Not being able to find any more just then I stood quietly awaiting developments. For eight minutes all was still. The old birds seemed to think all was well and kept out of sight in the weeds. But suddenly there was a faint peep from the grass in front of me answered at once by one of the chicks in my hands. At once Mrs. Grouse came forward through the fence and up as close to the little one as my position admitted. Then turning about she started back clucking and whistling in the most persuasive manner. Out of a clump of grass came a young bird and started to follow though several feet behind. Stepping forward I picked up No. eight. The commotion started up as before except that the male uttered now and then a note not unlike the warning note of a Crow, which seemed calculated to quiet the young. As they did not seem inclined to come closer I placed the little ones in my hat and stepped back. Then the fun commenced. After making a wide circuit around the hat the female ran swiftly up to it, looked in and flew off in terror. Solicitude for the safety of her young had brought this wariest of all our birds to approach an object of the most extreme terror to her. But she had seen her little ones and at once recommenced her tactics to induce them to follow her. The male was now as silent as she had been before. He seemed to think that this kind of work was beneath his dignity. On stepping forward to let them out of my hat I saw the ninth bird sitting out on a patch of clean ground, yet I had overlooked it several times, so closely was it sitting to the ground. I placed them all together on the leaves and stepped back a few feet. Immediately she came forward and one by one she coaxed them behind a stump and from there to the fence corner, where she left each one, and strange to relate not one stirred while she went after another. Finally she sat down over them and all was as quiet as could be. Not an indication of that contented peeping which you hear from a brood of common fowl for the little Grouse seemed to realize the gravity of the situation. Just one more test and I was ready to leave. How close would she let me come? Slowly I approached but not a feather moved. When within three feet she seemed to rise straight in the air and flying a few feet dropped out of sight in the brush. But this time not one chick stirred. All sat just as she left them. Why did they run the first time and sit still the second? Was her note different or were the little ones responsible for the action? If the Ruffed Grouse was as scarce everywhere as it is in the greater part of Western New York at present, we should not find out much from observation. As it was growing dark I left the little Grouse to their anxious parents and started toward home. I never expect to have another equally good chance to study the young of this shy bird and hope that after the foxes, owls and hunters have each had their quota there may be one pair for next year.

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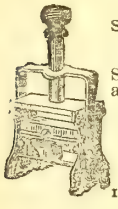

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To My Friends and Patrons:—

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With this sale I include my regular retail mail order business, which is by far the largest of its kind in this country, and as my successor in this department, all rumors and statements to the contrary—notwithstanding, Mr. Short is my *sole and only one.*

Mr. Short is well and favorably known, not only as a Naturalist and collector, but also as a writer on subjects pertaining to the Natural Sciences, hence a word of introduction to my patrons is unnecessary. I might add, however, that he was in my employ in '93 and has been up to this date in '95, and that I know him to be well qualified to carry on the business which he has undertaken.

I would further add that Mr. Short has leased my "shop" for a period of five years. This "shop" you are doubtless already aware was refitted and remodeled throughout in the autumn of '94, and that for conducting a business of this nature, is a model of its kind.

I would further add that this sale does not include either of my publications, nor my jobbing and Resort business, nor my stores at Chautauqua and Lakeside, nor my large private collection of Conchological specimens, but does include, and that exclusively, my regular retail mail order business in specimens and supplies.

Trusting my friends will extend to Mr. Short a continuance of the many kind favors and the liberal patronage that they have given me in the past, I remain, as ever

Faithfully,

Frank H. Lattin,

July 1, 1895.

Collectors Attention!

As many have expressed their regret at not being able to avail themselves of the unprecedented offers in Mr. Lattin's "Special June Bulletin" on account of the short time allowed I have decided to extend the time through the month of July on everything therein, except on birds eggs and scientific shells of which a new list will be sent all applicants.

Remember, this offer absolutely expires Aug. 1st, and will not be extended. Orders under 50c must contain *5c extra* for postage and packing.

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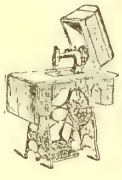

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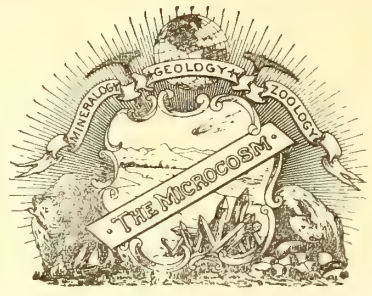

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Natural Science News.

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Gay Head.

The steady flow of modern travel has opened an easy way to the delightful island of Martha's Vineyard, where the socially inclined may enjoy the advantages of summer schools of science, or participate in the exercises of the camp-meeting within spacious and airy pavilions. Here the artist finds a prospect of varied color, with long vistas of cliff and sea and sky standing forth in surpassing loveliness and inviting an effort to place on canvas his richest and brightest tints.

To the student of nature, however, there is access to an ever-increasing store of facts. The more he investigates the structure of the region, with its assemblage of creatures and plants, or views the struggles of atmosphere, land, and ocean to maintain an equilibrium, the more he finds himself beset by perplexing questions, which will not be answered at his bidding. A riddle, as yet but partly solved lies involved in that wonderful piece of earthy structure called Gay Head. Here, at the western extremity of the island rests a huge pile of sand, rock and clay, more than one hundred feet high, tinted with numerous vivid colors, which have been the wonder and delight of the voyager ever since the discovery of the country. The sparse settlement of the island has as yet produced but a short chapter of the history of its people; but the record of nature's changes and disturbances, which have affected the land and sea, would fill large volumes.

To one series of these changes, belonging to its geology, we would now direct attention. The greater part of the island shows evidences of having been submerged five times beneath the waters. At each emergence from the water, an increased thickness was given to the body of the land, so that at the beginning of the last glacial period it stood on the western side at a level at not less than two hundred feet above the surface of the tide.

At the close of that period and chiefly remaining to the present time, a deep deposit of fine sand, boulders, gravel, and broken stones, from ten to twenty-five feet in thickness, covered the upper slope of the ridge. The Potomac Clay, which forms the inner and also the lowest descending division of the deposits resting here, rises like a central core to near the summit of this hill. As most of the other members below the glacial deposits are either absent from, or only feebly represented on, the upper surface of the clay, a thin bed of sand and other glacial material forms the superficial covering. On both slopes of this ridge, the west and the east, the column of geological formations is present, although not in fully unbroken continuity, the Cretaceous Green-Sand Marl having not been found on the easern slope by the writer. On this side, however, the Raritan Formation, previously defined in Maryland as the Alternate Clay-Sand group, displays an exceedingly fine exposure, with the strata and laminated layers in original order. Here also it is enriched with the same plant fossils and lignitic wood so characteristic of these beds on the Raritan, Severn, Magothy and other rivers of New Jersey and Maryland.

No evidences of mountain-folding appear in any part of the elevated division of the land. The underlying member which descends deep below tide, is the Variegated Potomac Clay, and this forms the foundation for all the other formations in their usual order of superposition.

Deep denudation and erosion followed the completion of the Potomac Clay, and it was cut to below the line of present low tide at the localities now occupied by Menemsha, Squibnocket and Nashaquitsa ponds. The broken surface of this clay, and the presence of the Raritan and other beds above it on the low hills of Menemsha Bight, show how deeply the Potomac formation was here degraded before the next succeeding formation was laid down. Consequently in early Cretaceous time a high plateau of the clay was carved into sloping reliefs which had their most depressed surfaces spreading away towards the east and south.

The steep side of the island is on the west, and here it is that the modern surf has cut away large tracts of the ancient bluff. On the Gay Head division the sea has been digging away the cliffs at the rate, it is said, of sixteen to twenty feet in a year. The stretch of boulders called the Devil's Bridge, lying at a distance of fully half a mile from the present beach, shows where the outer border of the bluff formerly stood. The Potomac Clay not only extends out that far at the bottom of this shallow shelf of Vineyard Sound, but we are told that it sticks to the anchor in the channel which now runs on a course more than two miles distant from the present beach. A searching survey ought to show that this clay underlies the Elizabeth Islands and stretching away south-west passes under the borders of the mainland of Massachusetts and Rhode Island, and from thence under Long Island and Staten Island to beneath the lower clays of New Jersey.

The section as it is now exposed in the less disturbed bluffs of Gay Head shows the Variegated Clay near the beach in strata or arched beds from three to more than ninety feet in thickness. The undisturbed upper part of this member is sometimes a whitish or red clay, and is often more or less mixed with sand.

Immediately above this, but not on the summit of the clay, rests the group for which we now offer the name Raritan Formation, from the river on the shores of which it is so extensively exposed. It consists of a few feet of brown, coarse sand at base, which is sometimes indurated into a moderately coherent sandstone. Above this is a bed,

two or three feet thick, of white sand locally streaked with white clay. Over this the laminated sands, black and gray, charged with lignite, and parted with fine white sand, rise up into thin layers of a paler clay which alternates with seams of the white sand. This clay appears more massive in some sections of the bluffs, and occasionally forms a homogeneous stratum from three to five feet thick. Next above this is a most conspicuous stratum of disintegrated granite, which is a kind of coarse rock-flour, white on the weathered surface, but gray in the covered mass. It forms a bed ranging from ten to more than fifteen feet in thickness. This forms the superior member of the group, while the whole Raritan Formation, as here recoguized, reaches a maximum thickness of about fifty feet.

Next higher in the bluffs rest the ferruginated remnants of the Cretaceous Green-Sand Marl. The great body of this deposit has slipped down or been overthrown upon the steep side of the cliff facing Vineyard Sound. It appears in three separate piles, stretching from near the summit of the projecting buttresses down to the beach. The only part of it now remaining near the line of its original position is represented by a few inches of altered brown sand in patches. These are the vestiges of the thin edge of the stratum which stretched out towards the sound, and which terminated in a bed eight to ten feet thick in modern time. Eighty or more feet outwards it is a thick body of dark-green sand, resting in one place on end, and much mixed on the surface, sides and end with gravel and fossils belonging to later formations. Bones of whales and fragments of shells of the Miocene Formation have settled into its broken surface; but in the unmixed interior of the mass, it has yielded to me soft casts of *Gryphea* and *Cucullea*, hard fragments of the bones of reptiles, with coprolites, and teeth of the shark *Otodus*. The component materials of this marl agree with those of the Lower Marl of New Jersey, and, like the latter, rest directly upon the upper number of the Raritan Formation.

The Miocene Formation, so far as my own observation extended, is broken up, and so mixed with the drift at the base of the glacial deposits near the surface that the only evidence of its former presence here, below the belt of conglomerate, resides in the presence of vertebræ of Cetacea, fossil shells, and some teeth of sharks.

On the surface is the fine pale sand, forming a loose bed, underlaid by about two feet of pebbly conglomerate which rests in a bed of broken rocks, gravel and boulders. The sand is spread thickly over most parts of the island, and along the western ridge it is set with granitic boulders measuring occasionally twelve feet in length and width by six to eight feet in thickness.

The wholeGayHead promontory is a scene of disturbed equilibrium, where the beds of rock-derived material have been softened by atmospheric agencies; pressed down by a load of stone and gravel, undermined by oceanic strokes of oceanic surf, and let down into gullies by trenching storms of rain. —*P. R. Uhler in Science.*

DOOR-YARD OBSERVATIONS.

Spiders.

Under the heading of Door-Yard Observations, a series of papers will be given on the objects of Natural History to be noted by lovers of study. There is much to investigate in any quarter, if the spirit of study impels one to note the creatures about us, and many points of interest may be found, where only barren premises are apparent to the unobservant. In any City or Village Door-Yard, and better still in suburban or country quarters, hundreds of interesting facts may be gathered by research and investigation.

The impression generally prevails that a boy or girl must be a scientist and have many books, and be able to rattle off jaw-breaking names, and have a large collection of bird skins, eggs, pickled reptiles, minerals, shells, etc., etc., before one can be recognized as a naturalist in any degree. This is all wrong, and, the sooner the notion is given up the quicker we will accomplish the true object of our efforts; namely—to thoroughly understand the life-histories of the insects, reptiles, birds and other creatures.

In all truth, I can say that the notes which have appealed to me with greater force, have come from observers who had very small collections and few books, or none. The boy who has a series of sets of eggs and proudly boasts and displays them, does not interest me as does the lad who can describe a peculiar feature in a bird's habits, or can distinguish all the birds in the brush by their notes. There are many lads who call themselves naturalists and who possess large collections, who could not identify one quarter of the rightful owners of the nests, either alive or dead. And too, there are thousands of young people who are anxious to study and observe, and yet who pass by innumerable points of interest daily and fail to observe them because they have not been schooled.

Insects and spiders are subjects for study, as well as the birds. Spiders are ever present and to be found in all situations, and their availability at all times and seasons makes them excellent subjects for home observations. It is safe to say that there are hundreds, more probably thousands of spiders in every door yard in the United States during the summer season, and even in winter a number may be found in the houses, if the quarters are kept warm. If my observant readers will go into their yards some morning after a dew they will be surprised to find many spider-webs in the grass. Of a certainty these webs are there throughout the warm months and well into the autumn, but their presence is never noted by many persons. In a morning's ride I have seen tens of thousands of these little webs on the shady side of the road; while on the opposite side the webs had disappeared; that is, the dew had evaporated from the sun's rays.

Our dooryard is on a corner, and to protect the grass from lawless persons who frequently cut across the sward, a barbed-wire has been staked and stretched. Under this wire and beneath an elm tree a colony of spiders have found protection, and there within a small area a dozen to thirty webs may be seen any morning. These structures are often destroyed by the dogs of the neighborhood who scratch around the tree. Then too, the man with lawn mower cuts the grass as often as every two weeks during the season, and entirely annihilates the group of spider-traps. But the little spiders are indefatigable workers and within two days the little gossamer canopies are again to be seen stretched above and between the blades of grass.

There are several species of spiders who set their traps in the grass. Some are fair sized, but most of them are small. One day I saw a full sized steel-blue wasp get entangled in the meshes of the grass spider's net. The powerful wasp tore great holes in the delicate web but could not disentangle himself. The fiery little owner of the net immediately rushed upon the huge captive and attempted to bite it, but the thick natural armor of the intruder saved him from the fangs of the enemy. The wasp struck about him viciously with his sharp sting but did not wound his small adversary, although the deadly poisoned spear often came near to him. When the spider found that he could not bite the wasp as he did the soft flies, he decided to entangle his huge captive and forthwith began to throw strands of silk over the struggling wasp.

Another spider, probably the mate, or at least a neighbor, now came upon the scene and the two worked hard to hold the prisoner; but at last the burnished wasp reached a strong stalk of grass and exerting all his strength tore himself loose from all the strands and cables which held him, and flew away.

There is a little Burr Oak tree just in front of our piazza. The lower branches almost sweep the ground and not rarely the spiders build their little fly-traps among the lower twigs, but I have never seen a web spun above five feet from the ground. Then there are the spiders who live about the house and offer a world of attraction to me. I have discovered four kinds (species apparently) which live in and about the piazzas. The side piazza faces the East: There are vines trailing at one end, while a long hanging flower box filled with *Pelargoniums, Nasturtiums* and *Cannas* make a pretty picture; and several flowering Fuchsias hang their festoons of blossoms from plant stands on the piazza and offer protection to the student or reader who desires seclusion from the observation of passers-by. A little forest of sweet peas with varied-colored flowers among bright green, fills in the space on the ground below the hanging box; the whole forming a pleasing exterior to passers, insects and hummingbirds. I often sit on this piazza after the sun has ceased to send his fiery rays into my nook.

Strangely enough though, the Spiders do not apparently care for the flowers, or perhaps it is more difficult to find them there; at any rate my best point for the observation of these interesting eight-legged creatures is on the front piazza which faces the north. There are no flowers upon it and there is only a Trumpet Creeper at one end and a few little flowers just below to relieve the monotony of city landscape.

Sometimes a day will pass and not a Spider be seen, and again a dozen will lend their presence and perform on the tight repe, or climb hand over hand, or swing down from a height by a slender yet tenacious cable. Their movements are exceedingly interesting, and much more varied than is generally supposed. One will often swing itself down from the ceiling of the veranda and sway about in the wind at the end of its cable. Occasionally one of these hangers will decide to return by the route he came, and he will turn about very quickly and ascend rapidly. Though hanging head down, one of the hinder legs is thrown about the rope and in a trice he is going up the delicate, yet stout silken cable hand over hand.

The climbing is done entirely with the feet of the front pair of legs, while the gathered slack is held just back of the second pair, with all the spinners that I have watched.* It would be interesting to find if a spider could climb a hanging cable if deprived of his front pair of legs. With a view to discovering if this could be accomplished, the fore legs were removed from a good sized individual, and though he was as lively as ever and could get about quite as well I could get no further performance from him on the line.† But it is quite probable that they could climb a perpendicular line as they use two or more pairs of legs when traveling on the lower side of a horizontal cable.

I have not yet been able to discover in what manner the slack was disposed of, for though it is easy to see it accumulating below the second pair of legs where it is held in a mass by the feet, as the climber ascends, it is not to be found after the spider reaches a perch. Probably the spider drops its furthermore useless bundle of twine.

It is a difficult matter to knock a spider from its perch without its securing a hold by means of its silken cable. When in danger from any violence, or if the wind blows strong Mr. Spider instantly touches the tip of the abdomen to the spot where he is resting, and he is secure. From this hold he can spin out yards and yards of strong, unyielding, yet delicate silken strand, and by which he can return to his original perch whenever he wishes. He is also provided with an arrangement for cutting the cable whenever he desires. How this is done I do not know, but judge that it is accomplished by an apparatus near the spinner. It may be done by the legs or feet, but I could not detect it. Certain I am that it is not performed by the mandibles. Sometimes the Spider while hanging head down will suddenly separate from the cable and drop.

Some spiders show reason and judgment and accomplish things which cause us to wonder. One day on the veranda we watched a small spider as it descended by spinning. To try an experiment my companion, who was smoking, held his cigar under the spinner when he immediately turned and rapidly ascended. After a foot had been gained the cigar was held just above him when the downward spinning was again adopted. The experiment was repeated several times, until at last, either from digust, or because he was spun out, he cut his cable and disappeared.

If an observer catches the cable above a spinning spider and continues to gather up the spun thread as the spinner drops lower, it will be found that after a few moments of spinning, and when three to ten yards or so of cable has been spun, that the spider will quit spinning and drop to the floor. We call this spinning out, that is running out of silk. I have caused a Spider to spin over fifteen yards of silk in this manner by reeling off the cable on my hands; and though invisible to the human eye, yet I could feel it on my fingers.

At times Spiders spin a cable from a limb of the oak and sail out into space and strike the veranda; sometimes striking a column, but oftener landing on the railing or floor. In making these interesting sails through the air the little fellows would sometimes occupy as

* This is the habit in rope climbing with several caterpillars also that I have observed, as will be more fully spoken of later.

† It must not be considered that it is cruel to amputate a Spider's legs. The lost legs are quickly replaced by new ones, and the creature does not appear to be worried by their loss or in any pain, and will savagely attack and eat an inseect just after its own mutilation.

much as half an hour in swaying back and forth before a good landing could be effected.

There are many points to be told of the habits of Spiders, particularly regarding their nestings and care of eggs, and their manner of catching and feeding on unlucky insects. They are very voracious as well as ferocious and when insect food is not present in sufficient quantity, will feed upon one-another.

Their enemies are numerous, and many species of birds eat them whenever found. The common toad also feeds upon spiders, and perhaps this is the worst enemy the ground nesting Spiders have.

MORRIS GIBBS.

Vacation Studies.

Our leading colleges have provided "Summer schools of natural history," which are proving most useful aids to science and education. Of these we may speak hereafter. At present we wish to point out that it is in the power of every person of average attainments to utilize a summer's vacation, in the interest of science. And this can be done, too, at no special cost in money, time or convenience. It is only requisite to make use of one's opportunities of observation.

Very recently, a charming account of the way in which the "agricultural ant" makes its toilet, has gone the rounds of the newspapers. The observer, the Rev. H. C. McCook, brought the matter before the Philadelphia Academy of Sciences, and it thus obtained publication. The tidiness of these ants, the care and thoroughness with which they "comb" and "sponge" each other, the singular attitudes they take during the process, and the pleasure they seem to have in being cleansed, are deliciously described. The account is thoroughly entertaining, and yet, because it is precise, it is of decided scientific value. Sir John Lubbuck has been equally successful in studying the habits and reasoning powers of other species of ants, and has contributed to natural history a great deal that is new, interesting, and valuable.

Now the ant has been observed at least as far back as the time of Solomon. No insect has a more extended range in literature, except, perhaps, the "busy bee." Being found in all the temperate and tropical climes, the ant has been easily studied. And yet here we have within a year or two these great additions to knowledge on the subject.

We doubt not that the same amount of patient, careful observation, if applied in other directions, would bear equal fruit. The operations of a fly in cleaning himself are almost as elaborate as those of Mr. McCook's ants. The most supple contortionist that has ever gained the stage title of an "india-rubber man," never did anything with legs, arms or backbone, half so astonishing as a honse-fiy does when cleaning his wings. To throw the legs over the small of the bock, and pass them slowly downward to the extremity of the body, and then to wipe them off in the mouth is a performance that no human acrobat would think of trying. The fly toilet has been partly studied and described, but the man or woman who shall *thoroughly* observe it, has not yet taken advantage of an every-day opportunity.

On an idle day in the country, there are thousands of things around us that would repay study, even if nothing new or strange should be discovered. Merely as an instance, we may cite one of the experiences of the writer of this article, when spending a few days on Shelter Island. The locality is opposite Greenport, L. I., and is sheltered on all sides. Long tongues of land stretch out north and south of the island; it lies in the basin of a great bay, and is protected from the ocean by Gardiner's Island, which stretches partly across the opening. The tides there rarely rise more than three or four feet, and surf is unknown. In the still waters that surround the island there is the most endless variety of marine life, and strange forms of radiates and mollusks are to be seen by anybody who looks into the quiet depths.

In preparing to catch blackfish there, it is customary to collect a quantity of fiddler-crabs for bait. These crabs are queer creatures. You may see them in numbers on the sandy beach twenty feet ahead of you, but when you reach the spot where they were, there is not a fiddler visible. As you approach every one of them has retreated, wrong end first, into holes that in dry sand may be two or three feet deep. Possibly the crabs see a person approaching them, but it is more probable that they take alarm from the vibration of the soil, caused by footsteps. They have a limited power of hearing, and the writer has twice seen them shudder when a gun was fired at a distance, but, strange to say, it did not alarm them so as to cause a retreat to their holes. Words spoken quite loudly do not seem to frighten them. Their sight is better than their hearing, and yet if a person stays, sitting or standing, motionless for about ten minutes among the crab holes, he may see the fiddlers come out cautiously, almost under his feet.

Remaining quiet thus, one may observe the curious performances of the crabs, though they rarely go far from their holes and are ready to retreat at any moment. Most of them engage in feeding; a few, in digging out their habitations. The latter process is laborious. The crab carries up from below, held between his forelegs and claws, a large pellet of moist sand; and taking it outside of his hole, deposits it at a distance of three or four inches. This pellet has come from the bottom of the hole, and has been clawed off and shaped there. It is usually darker than the surface sand, and contains more or less of vegetable substance; it is dirty sand. When a sufficient number—say one or two dozen of these pellets—may have been provided, they lay the foundation for a square meal.

The feeding is a less tedious operation; it consists in picking the eatable matter out of the pellets. The smaller of the two arms of the crab does duty as a fork, and the rapidity with which it transfers to the mouth is such that the morsels selected—probably not bigger than a pin-head—cannot be seen while in transit. The double-claw of this smaller arm is nsed exactly as if it were a hand with two fingers. The food is tucked into the mouth with it, fast enough to keep the crab's jaws constantly in motion.

But now and then, while feeding so rapidly, the fiddler will take a reconnoissance. He raises himself on his hind legs, stretches his body to its full height, and spreads out his great forearm, undoubling it for the purpose. The attitude is that of listening, and there can be little doubt that such is the object. The male crab cannot remain in this position more than a few seconds, as his great claw makes him top-heavy. It was while thus erect that fiddlers were observed to shudder at the report of a gun.

(*Continued next week.*)

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Mountain Partridge 1-10	75	McCown's Longspur	1 00	Mountain Bluebird	12
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Remember, this offer absolutely expires Aug. 1st, and will not be extended. Orders under 50c must contain *5c extra* for postage and packing.

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NATURAL SCIENCE NEWS

VOL. I. No. 25. ALBION, N. Y., JULY 20 1895. Weekly, $1.00 a Year

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Zircons in large, modified and small brilliant Crystals.

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Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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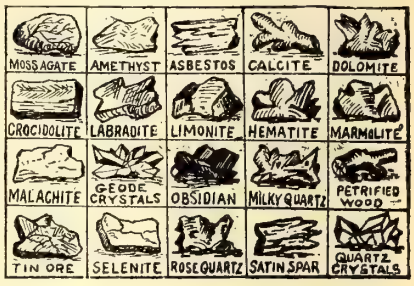

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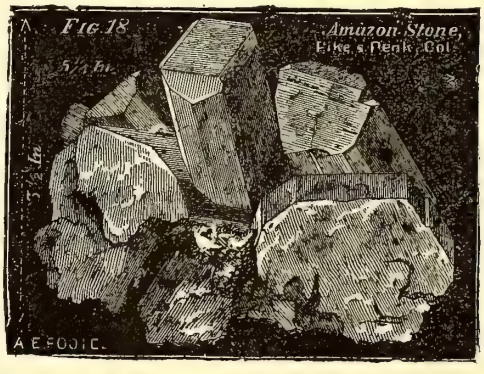

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Natural Science News.

VOL. I ALBION, N. Y., JULY 20, 1895. No. 25

Natural Science News.

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A Naturalist in Florida.

A series of letters, descriptive of a cruise along the Florida coast, had nearly reached a conclusion in *The Valley Naturalist*, when that periodical recently ceased to exist. We give here the final letter, No. 6, of the series, in order to complete its publication, and also to give our readers a pleasant glimpse of some wild scenery. The vessel which carried the explorers was called the "The Rosebud," and, at the date of the letter, was off Sandy Key.

A "norther" which disturbed our slumbers during the night had died away, and was replaced by a dead calm. The morning sun, barely above the horizon, lit the waters of the bay with dazzling brightness. Nearly west of us, and distant seven miles lay Cape Sable—the extremity of the mainland of Florida. On it stood a group of trees which towered above all others. These were Royal Palms, whose wood is so scarce that the law forbids cutting them. Beyond, we could see the deep, dark waters of the Gulf. Immediately around us lay thousands of acres of "mud flats." The wind and tide having made them bare, seemed to invite our attention to the numerous treasures of the deep, lying helpless upon them. After a hasty breakfast we went ashore and were soon gathering shells. Two species—*Fasciolaria gigantea* and *Pinna muricata*—were seen by thousands. The former are generally from twelve to fifteen inches long; some grow to be nearly two feet in length. The *Pinnas* are always moored by a byssus to the broken shells and sand below. This byssus resembles the finest hair or silk, and is attached to the animal at its posterior or small end. Thus moored, the bivalve stands upright and fixed, with its two valves open, ready to suck in the food which the currents of the sea bring to it. On touching the valves they close instantly. We secured a barrel-full of the shells. Growing in shallow water were a number of mangroves. We found attached to these the common "*coon*" oyster, along with several small species of shells. Some rare forms were obtained, and when the returning tide drove us off, we left with regret.

After dinner we weighed anchor, hoisted sail, and headed for Cape Sable. A run of an hour and a half with a moderate breeze brought us up under the Cape. A good anchorage was found about ten rods from shore, and we disembarked. The rest of the afternoon was spent in exploring the country. It looked as though we had reached the jumping off place of creation. There were no inhabitants within a hundred miles. Before us lay a vast wilderness, stretching far to the north, and eastwards to those mysterious Everglades, where even now the foot of a white man seldom treads. Along the shore in front of us, appeared a narrow strip of clear or prairie land, perhaps forty rods wide and three miles long. It was in reality a raised beach or terrace, about ten feet above the ordinary tides, and made by successive accumulations of sand and dead shells. Its contrast with the usual dead level of the Florida shores was striking. This prairie was covered with coarse grass, thistles and *Agave rigida*, var. *sisalana*. Back of it was the wilderness, in all its native wildness. In the course of our walk we came upon the remains of a cellar and some charred timbers. These were probably the relics of old Fort Poinsett, built by our soldiers who were stationed here during the Seminole war. Returning along the beach, we saw sharks and saw-fish in abundance. More than fifty were feeding upon schools of small fish, which they had driven close in shore and were gobbling down *ad libitum*.

Our last day on Cape Sable was of special interest. Two of our party—Dr. Brown and myself—went across the prairie to the woods beyond. We found the walk anything but an easy task. There were millions of mosquitoes, bound to taste our blood at all hazards. We had to force our way through a tangled mass of mangroves, scrub oaks, and underbrush, to which clung in endless masses millions of vines and cactus. We finally came to an open space where there was room to turn around without running one's face into a cactus.

Just then the Doctor uttered an exclamation and pointed to some trees near by. The dry limbs were covered with flowers. On examination the flowers were found to belong to "air-plants." Of these there were two species. Of course we wanted some to take home. The Doctor had begun climbing a tree when I perceived some kind of wasps flying out of the plants above him. It was only when a dozen or so began making music around his ears that he felt compelled to retreat in a way more hasty than elegant, and to the utter ruin of some fine prickly cactus underneath. Having repaired damages, we secured specimens of the air-plants where the wasps were fewer. The specimens which I brought home are now in my greenhouse, where they have since blossomed regularly. One is an orchid, *Epidendrum conopseum*. The other is a bromeliad, *Tillandsia bracteata*. Both are pretty, and when seen by the thousands as they grow in Florida, simply clinging to the limbs of trees without any other visible means of support, present in bloom a grand appearance. After this we worked our way out to the edge of the forest. Here, on some gum trees, we found *Orthalicus zebra*, ten or fifteen feet from the ground, and managed to secure several. We also found for the first time, the shell of *Lignus fasciatus*. The specimens of this were dead; there were three varieties, all of which are now in my collection. This species is common to the Bahamas also. In the prairie, we found underneath thistles, agaves, etc., several interesting shells.

After dinner on board ship, one

of our party, with two men, taking harpoons and lines, got into the dingy and started for some sharks not far off. The harpoon was soon thrown with telling effect. The victim proved to be a porpoise instead of a shark. They struck him not more than twenty rods from the schooner, but in ten minutes both boat and porpoise were half a mile away. There were three hundred feet of line attached to the harpoon, and this was let out as necessity demanded. The monster would dive, but being an air-breather was obliged to come to the surface every few moments. At such times they sometimes got him near enough the boat to hit him with an axe, but apparently with little effect. Being afraid of losing him, another harpoon (carrying three hundred feet of line) was driven into his side. Still he seemed as vigorous as ever. Signals were made for a rifle; this was sent to the scene of the conflict by another small boat; and four bul lets were fired into the animal. But they failed to kill. For two hours and a half the chase was kept up. At times he went through the water with terrific speed. They traversed at least ten miles, and I expected more than once to see the boat swamped. But fate was against the porpoise, His blood was pouring in streams from six wounds. He was evidently getting weaker, and toward the last swam close by the Rosebud, making for the land. When a few rods from shore he gave one tremendous groan, and expired. A shout of triumph went up from the party. He was towed to the beach, and a careful measurement showed him to be nine feet four inches in circumference in front of the dorsal fin. We estimated his weight at twelve hundred pounds. The process of removing the hide occupied three men an hour and half. He was an old male, and had lost several teeth. In his stomach were a dozen mullets, evidently eaten just before he was struck. The hide of the porpoise, elegantly mounted, is now in the museum of the Chicago Academy of Sciences, along with sharks and other trophies of the cruise. That night we sailed for Key West. The collections of the expedition were shipped home, and a few days after I left by steamer for New Orleans. This closed my connection with the Rosebud Expedition.—*W. W. Calkins in an old issue of Science News.*

Common Sponges.

Twenty years ago, sponges were sufficiently proved to be animals, but have not until lately been admitted into the zoological classifications. They are now known to belong to egg-bearing Metazoa, though probably the simplest of that grand division of animals. An ordinary sheep's-wool bath-sponge, which comes from our southwestern coast, and can be bought cheaply by the pound at all wholesale druggists, is recommended as the most available for class teaching. Other sponges, known to the fishermen as "dead men's fingers," can be found commonly on the piles of old wharves and rocks below low tide, along our northearstern coast.

When living, the commercial sponges—for there are a large variety of *Spongia* known to the naturalist, which from various causes, are not employed in the arts—are of a dark brownish or blackish color and resemble beef-livers, the chitinous fibres of the skeleton being nowhere visible. The larger openings of the main tubes or canals penetrating the mass are apparent when the animal is undisturbed, but close when it is handled; the smaller openings are not visible, being covered by an external skin which envelopes the whole mass. This skin consists of two layers, of which the inner also descends into all the tubes, lining the cavities throughout the body; the outer layer one does not descend far into the canals, and acts as a sort of seive throug which the water is sucked by a peculiar mechanism into all the small chambers and canals, whence it finds its way into the great vertical trunks and is ejected with force at the two or three large orifices which are so plainly to be seen in a distended bath-sponge. The water thus circulating through the interior of the sponge yields up its nutriment, (a minute stomach being improvised out of a cell of the dense fleshy mass which is supported by the elastic fibrous skeleton and comprises the living substance of the sponge), the instant a floating morsel is captured by one of the tiny threads which stud the interior chambers of the animal. These threads are always stretching out into the passing current, fishing for food. The sponge, then, has no permanent stomach, but extemporizes as many as it has mouthfuls, out of any portion of its interior surface which is convenient. When the particle of food is digested, the refuse is forced out into the expelling canal, and the quondam stomach disappears. The food consists of the floating clouds of minute animals and plants which abound where the Metazoa flourish.

Sponges whose skeletons are of a horny substance called keratode, do not grow on our coast north of Cape Hatteras, nor on the coast of Europe north of France; their limit in the Pacific is not percisely ascertained, but does not extend far north. It is to this class that the commercial sponges belong. None useful for domestic purposes are found on our Atlantic coast north of Key West; but in the Gulf they occur up to Santa Rossa. Key West and Nassau are the principal markets. The majority of those displayed in the windows of apothecary shops are from the Mediterranean. In these the lighter color and superior elasticity and density of the skeleton are apparent. They hold water better, are much softer and more agreeable to the touch, and far more elastic and durable than the American forms, which, of course, they greatly exceed in price. The inferior quality of American sponges is probably due to the excessive heat of the waters in which they live, to the greater scarcity of food, and to the great quantities of chalky sediment beaten out from the shores and reefs by the winter storms of the Caribbean Sea. The Red Sea sponges are not so fine as the Mediterranean, but better than those from our shores. Altogether, only three species are sold in the shops, but these are divided by the dealers into a great number of varieties, each of which is named according to locality, etc.

Sponges grow always attached to hard surfaces, coral-reefs being the favorite support. They are hunted for in shallow water by the use of a water-glass. This is a tube of thin boards or iron pipe, several feet long, with a frame of glass at one end, which, when submerged, prevents the fishermen's sight from being disturbed by the glare of the moving surface of the sea. Having discovered the sponge, it is captured by the aid of a sort of fork, or by divers who descend either naked or in armor.

The naked diver is carried down by a broad flat stone of marble, of about 25 pounds' weight, which he holds at arm's length in front of him, and uses to guide his descent, to protect his head when he first

strikes bottom, and to keep him down when he walks on the bottom. Fifteen to twenty fathoms is the ordinary depth; but beyond this, to forty fathoms (240 feet,) which is reached in the Mediterranean, more preparation is necessary. The man, standing naked in the boat, with the greatest energy practices inflating his chest to the utmost for about ten minutes, and, when the blood is thoroughly oxygenated by this means, seizes the stone and plunges headlong into the sea.

When the Mediterranean diver is at a great depth, he often remains, in trying to fill the net-bag which is tied about his neck, until he feels the sensation of drowning —the desire to sleep. Alarmed by this last symptom of exhausted nature, he jerks the rope which he has taken down with him, and is hastily pulled up by his companions in the boat. If he loses the rope he is usually drowned. The return to surface, where the pressure is so much reduced, causes the blood to flow from mouth, nostrils and eyes; and this, with the absence of normal inspiration for so long a time, brings on a fainting fit which lasts, according to the depth, for a longer or shorter time. Two minutes is the usual duration of a dive, and three and a half the utmost extent of endurance. The pressure of the water on all parts of the body at a depth of 20 fathoms (120 feet) is about 50 pounds to the square inch—at 50 fathoms, 75 pounds, or five atmospheres. Think of such an enormous pressure all over the body when one is trying to hold his breath! Should the diver breathe out the air he holds in his inflated lungs he would never be seen alive again. From this terrible tension arises the curious habit the divers have of blowing rather than breathing out the air the moment their heads rise above the surface of the water, while the fresh air is drawn in with a loud, quick respiration. It sounds much like the "blowing" of a whale or porpoise, and is percisely analagous.

In American waters, divers never go deeper than about a hundred feet. This is also nearly the limit for those using the cumbersome armor, which the divers are loth to wear, considering it more dangerous than to go down naked. The skin is burned all off the shoulders of the habitual divers, by the combined action of sun and salt water; and their hair becomes of a greenish tint during the summer, returning to the natural color only when the diving has ceased for the season. The coarsest kinds of sponges only, are taken by such rude methods as harpooning or dredging.

The preparation of the Mediterranean sponges for market is conducted with care, they being beaten or trodden out. The American sponges, on the contrary, after being exposed to the air about twelve hours (when they are said to be "killed") are then pitched into pens formed of stakes driven close together in shallow water. Here all the membranes speedily decompose, and leave but little "flesh" in the skeleton which is then squeezed and washed out by the fishermen. The sponges are then dried and bleached in the sun, sorted into sizes, strung upon strings, and sold to the agents. These take them to the warehouses, where the hard calcareous bases, by which they were attached to the ocean bottom, are trimmed off. A second sorting according to quality is made, and they are compressed into bales ready for forwarding to London or New York. American sponges, besides being employed in the bath and hospital, are torn apart and used as stuffing for cushions, mattresses, etc., and for the manufacture of certain rough kinds of cloth.

The foregoing facts are selected from Hyatt's "Commercial and Other Sponges," the third of the series of pamphlets published by the D. C. Heath & Co., of Boston.

A Few Field Notes.

I give below a few notes copied from my "Field Book."

I have thought best not to revise them, but give them just as they are written in the book.

I am sorry to say that I have had no opportunity to study or collect since May 1st as, owing to change of business I have had to move into the city.

Jan. 28th. It has been snowing for four days with occasional stops of a few hours, and today there is about seven inches of snow on the ground. I took a little stroll along the pasture brook this afternoon. The scenery is very beautiful in some places where the tall broken horse weeds, and briars and small shrubbery is bent half over under the weight of the glistening snow, the scenery was grand beyond discription. In one place in a bend of the brook, where a clump of willows, weeds, briers and small bushes fill up the semi-circle made by the winding brook, I stood entranced for about fifteen minutes admiring the magnificent picture. Had I been an artist I would have copied one of the most beautiful winter landscape pictures imaginable. Found a single pair of quails, a few red birds, worm eaters, snow birds, and any number of blackbirds and crows, but as yet no migrants.

Jan. 30th. Took a stroll this afternoon, nothing of importance to mention, except a case of woeful ignorance. Met a farmer out hunting and after a few moments conversation I glanced towards a willow tree, on a branch of which sat three little Junco's, wfth pretended ignorance I asked what kind of birds they were. "Them's blackbirds," he replied, I was not a little surprised, and remarked, "are they not rather small for blackbirds." "O, no," said he, thems the small kind of blackbirds." I made no farther comment on the subject, and did not try to enlighten him on the matter; but I confess I am at loss to understand how it is one born and raised on a farm, would not recognize a *blackbird*, now I will not be surprised if he should call an owl an eagle.

Jan. 31st. As I went to the P. O. this afternoon I noticed a little bird sitting among some elm sproughts on the roadside, I stopped to observe the little fellow and found it to be a tufted titmouse, I stepped to within five feet of the bush, but birdie never moved a muscle except to wink at me now and then—it is the first one I have seen this season. I notice a great many small birds are being killed this winter by the severe weather, and those feathered cannibals. Coming home from the P. O. I saw a flock of wild geese light in an open field about a quarter of a mile distant; when I got home I went to a second story window in order to get a good view of them. I counted thirty-seven, the ground being slightly covered with snow they could be plainly seen. They fed on the frozen wheat about three quarters of an honr and then left.

Feb. 11th. On my way to the P. O. this morning I saw for the first time in many years, a live specimen of the Pigmy Owl. I was much surprised and greatly pleased; I stcod watching him some time but as I had no gun, this rare bird made his escape.

Feb. 20th. The birds are returning and the very first to arrive

is the Yellow Warbler—saw three this morning.

Feb. 24th. The Warblers are closely followed by the Meadow Larks—first note heard today, and later during the day saw several. I listened to their whistle for a long time and as near as I can translate it, it is something like this: Sweet-o-lots—when-u, then changing to—Sweet-chick-chick-chick, and sometimes thus—Chick-a-sweet-a-whe-e-e. The whistle is clear, tolerably sharp with a very slight touch of a liquid ring.

March 12th. I see the Crows have begun to build, saw one carrying a twig this morning. It is the first bird to commence nesting this season that I have seen. All the birds seem slow in mating this season.

April 2d. A great many Red-naped Woodpeckers have taken possession of the trees in our yard.

April 18th. Blackbirds, Thrushes, Robins and Sparrows are building—saw several of them working today. The weather has made late nesting and discontent among the birds.

MORRIS RICE,
St. Louis, Mo.

Vacation Studies.

(Continued from last week.)

These crabs have a delicately figured shell, and are known as "calico backs." One day a fine lot of fiddlers was collected from a strip of blue mud, where they were feeding at low tide. In general, they select situations for their holes that will be covered at high water; but some of them go above that line, and then make very deep holes, probably in order to reach the moister earth. Now, the remarkable circumstance, as it seemed to us, was that the fiddlers gathered off blue mud were not "calico-backs;" their covering was of a dark, burnished steel blue. "You will never catch any fish with those blue-backs," said one of the sages of the shore. This did not turn out to be exactly the fact, but the blue-backs proved less attractive than the others, probably because less showy on the fish-hook.

Now here was a plain instance of protective coloring. The mottled calico-back was least distinguishable from the sand: the blue-back was least visible on the mud. To a bird hovering overhead, looking for crabs, these might be just the most deceptive conditions. But assuming this theory, a new difficulty presented itself. Many of the male crabs had the elbow of the great arm ornamented with a very bright red color. This remained a puzzle until one day when we undertook to catch fiddlers in the grass that grows on some of the flats. After seizing grass instead of a crab two or three times in succession, the mystery was solved for us very simply. We found that the lower joints of the grass were frequently of a bright red, exactly corresponding to that of the fiddler's elbow.

We could go a little further, perhaps, and assert with some confidence that the brightest, gayest, most speckled of the calico-backs were those which were dug out of the dryer sand that they most resemble; that the crabs in intermediate stations between blue mud and sand were of a dull, indefinite hue; and that the fiddlers with red elbows were more frequent in the marsh grass than elsewhere. But we have said enough to indicate what kind of things can be noticed without laborious effort, in a brief holiday. There are plenty of such opportunities. If one has not a taste for natural history, he may do service by observing the clouds, the winds, and the barometer; by counting and mapping the August meteors; or by looking after glacial scratches, transported boulders, and moraines. For all this no special scientific training is required, and even though the disc overies made prove to be very old and well known, they will not be useless if they lead to the habit of seeing with one's own eyes, rather than through books.—*Science News.*

Activity of Animals.

In a recent number of Science Mr. Stewart gives the results of some interesting experiments upon the activity of animals that were made upon rats, mice, and squirrels inclosed in circular cages so arranged that every motion of the occupant caused the cage to revolve. An automatic apparatus permitted of registering the motions of the cage and of consequently ascertaining the periods of rest and activity of the animals. Rats and mice divide their time into twelve hours of rest and twelve of intermittent work during the night. During the period of work, the intervals of activity rarely exceed one hour; and are separated by intervals of rest of a nearly equal duration. In winter the squirrel works almost continuously from twenty minutes to two hours in the morning, and sometimes a little in the evening also, but during the balance of the time it remains at rest.

The food has a marked influence upon the daily activity. As a general thing, the richer this is in protein, the greater is the activity. Fatty substances have a contrary effect. They reduce the activity of mice from six to eight hours to a few minutes of work a day. In order to ascertain the influence of alcohol there was given to four rats fed upon dry grain some of this liquid at proofs varyiug from 5 to 60 per cent, instead of water. This treatment, kept up for fifty days, showed no uniform effect of the alcohol.

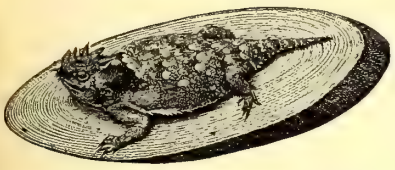
All the animals experimented with did more work when the barometric pressure was high.—*Scientific American.*

A Natural Barometer.

The most curious of the many natural barometers consists of a glass jar half full of water and a leech. The leech is put into the water, and a piece of muslin is tied over the top to prevent the leech from getting out. I have kept them for a whole summer and sometimes late in the fall at which time they invariably died off I found them an infallible weather barometer. When fine weather was to be the order of the day the leech would remain at the bottom of the water, coiled up in a spiral shape, and perfectly motionless. If rain was to be expected it would creep to the top of the jar, and remain there until there was a likelihood of more settled weather. Just before a storm it would squirm about and contort itself violently. For some days before a thunder shower it kept out of the water almost all the time and occasionally moved its body in a convulsive fashion. It has been said to foretell frosty weather, behaving in the same manner as for fine, and for snow in the same manner as for rain. But I have never seen it verified as mine all died before the first appearance of winter. This interesting barometer can be had by all as the leeches may be found in every stagnant pool or pond. For the top of jar I used a perforated zinc which was screwed on to a fruit jar, which will make it look neater and fit for any private museum.

W. J. WINTEMBERG,
Washington, Ont.

HORNED TOAD,
Phrynosoma.



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For sale at a bargain, for cash, a collection of Modern Sioux Relics. Ghost Shirt, War Club, Moccasin, Bow and Quiver of Arrows, Knives, Scabbard and Whetstone. Fine Pipestone Pipe and ornamented Tobacco Pouch. Points, Bags, Whip, Bone Necklace, Waist Belts, &c. All collected at Pine Ridge and in first-class condition. E. H. HARN, Henry, Lincoln Co., N. C.

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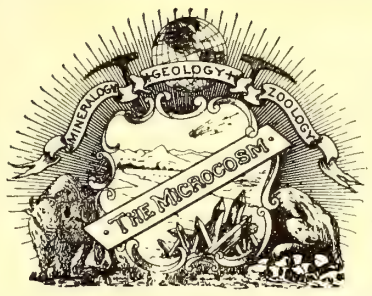

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Special Bargains in Bird Skins, Mounted Specimens, etc.

BIRD SKINS.

	reg. pr.	sp. pr.
Pintail Duck, very fine	$2 00	$1 00
Black Duck	1 25	75
American Bittern	1 00	65
Hairy Woodpecker	30	12
Downy Woodpecker	25	10
Anna's Hummer	75	30
Rufous Hummer	75	30
Rusty Blackbird	40	15
Snowflake	25	12
Grassfinch	25	12
Tree Sparrow	25	11
Slate-colored Junco	25	13
Towhee, very fine	25	13
Spurred Towhee	40	19
Rose-breasted Grosbeak, very fine	45	25
Indigo Bunting, very fine	30	14
Scarlet Tanager	60	31
Cedar Waxwing	25	11
Blue-winged Warbler	75	20
Parula "	25	10
Yellow "	30	10
Myrtle "	25	10
Audubon's "	50	20
Chestnut-sided "	25	11
Bay-breasted "	60	25
Black-poll "	25	13
Blackburnian "	40	18
Bl'k-throat'd g'n "	50	13
Mourning "	75	35
Maryland Yellow-throat, fine	25	11
Yellow-breasted Chat, fine	40	13
Brown Creeper	30	10
White-breasted Nuthatch	30	13
Chickadee	25	10
Wren-tit	60	20
Western Golden-crowned Kinglet	40	14
Ruby-crowned Kinglet	35	11
6 species showy S. Am. Birds	3 00	85

All these skins (except the S. Am. which were put up by the natives) are good; some of them, especially most of the Warblers, are extra fine. The S. Am. skins are very brilliantly colored and have to be seen to be appreciated.

Any sent prepaid at price named.

MOUNTED BIRDS.

	Reg. pr.	Sp. pr.
Yellow-billed Tropic Bird	$ 9 00	$5 50
Man'o'war Bird	12 00	6 00
Laughing Gull	3 00	1 25
Wood Duck	4 50	2 20
Cotinga, rare S. Am.	5 00	2 55
Calif. Quail, in fancy case	6 00	3 00
Hummer, in round covered plaque	1 50	75

Mounted specimens sent by express at purchasers expense.

MAMMAL SKINS.

	reg. pr	sp. pr.
Red Bat, N. Carolina	2 00	65
Least Mole, N. Carolina	1 50	40
Pocket Gopher, Minn	3 00	1 00
Pacific Pocket Gopher, Oregon	2 50	85
Harvest Mouse, Indiana	1 00	35
Common Mouse, "	50	20
Big-eared Mouse, "	1 50	50
Michigan Mouse, "	2 00	75
Common Rat, "	1 00	30
Chipmunk "	1 00	30
Oregon Chipmunk, Oregon	1 50	50
Pine Squirrel, Oregon	2 00	68
Red Squirrel, Indiana	1 00	32
Flying Squirrel, "	1 25	42

Mammal skins always accompanied by skull and Scientific name with full data. Sent prepaid at prices mentioned.

MOUNTED MAMMALS.

	reg. pr.	sp. pr
Black Squirrel, not on base	$ 3 00	$1 00
Skunk, 10-in. nicely striped	5 50	1 50
Deer Head with antlers, 3 prong	15 00	8 00
Deer Head without an'rs, on shield	12 00	6 00

Fancy base for squirrel or skunk, $1.00 extra; shield for large deer head, $1.50 extra. Sent by express at purchasers expense.

These special prices good only until August 30th. Order early as I have but a few of some species.

Address, ERNEST H. SHORT, Albion, N. Y.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

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Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

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Florida Sea Shells and Curios.
Bird Skins and Eggs a Specialty.
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MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

Large Resurrection Plants,

By mail, 10c. Small, 5c. G. W. TUTTLE, Pasadena, Calif. 19tf-o

FIRE SALE!

Being overstocked with Natural History goods and wishing to reduce same just as soon as possible, we offer the following prices.

We need money. If you are a "live" collector and need specimens for your cabinet NOW is the chance of your lifetime to get them for comparatively nothing.

We pay postage or expressage and we also guarantee every specimen sent out to be perfect.

KIRKE B. MATHES, Narragansett Pier, Rhode Island.

SHELLS.

First column gives regular ordinary prices and last "cut" prices.

	Regular	"Cut"
Pearly Nautilus (fine)	$2 00	$ 98
Chambered Nautilus	1 75	85
White Murex, large	35	16
" " medium	25	14
" " small	15	10
Pink Murex	25	19
Black Murex	35	16
Murex Brandaris	10	02
Snipe-billed Murex	50	20
African Murex	50	20
Trumpet shell	2 00	90
Triton Lampas	1 50	60
Fasolaria distans	25	08
Mitre shell	25	11
Gem shell	10	02
Tent Olive	1 00	38
Hoop shell	40	21
Marlinspike	35	16
Auger shell	15	07
Marbled Cone	50	30
Lettered Cone	30	12
Dotted Cone	20	12
Soldier Cone	20	08
Virgin Cone	35	18
Silver Lip	15	07
Spider shell	25	08
Arabian Cowry	15	05
Gnawed Cowry	15	05
Money Cowry	15	05
Tiger Cowry	15	07
Panther Cowry	25	12
Spotted Cowry	25	12
Helmet shell	2 00	90
Yellow Helmet	2 50	1 25
Black Helmet	1 00	70
Cameo, large	75	35
" small	35	15
Cask shell	20	08
Bleeding-tooth	10	02
Green Snail	50	30
Banded Snail	20	07
Turks Cap	35	18
Pearl Trochus, large	50	30
" " small	25	10
Chiton	20	09
Black-mouth Snail	15	06
Peanut shell	10	01
Angels Wings (pairs)	1 50	75
Sun shells	05	02
Milk Strombus	35	12
E. I. Clam, large	1 00	40
" " small	50	17
Crown shell	1 00	40
Cypræa Mappa	2 00	1 00
Strombus Vitattus	25	09
" Granulatus	25	09
Cockle shell	20	05
Furblo Clam	50	20
Japanese Eburna	20	07

MARINE CURIOSITIES.

	Regular	Cut
Mounted Porcupine Fish	$1 00	$ 50
" Baloon Fish	1 25	70
" Toad Fish	1 25	70
" Sawfish, 3 ft	3 50	3 50
" Alligator, 2ft	2 00	2 00
Sawfish Saw, 10 in. perfect.	35	18
Hermit Crab in shell	50	16
Alligator's Egg	25	16
Nurse Shark Egg	75	30
Skates Egg	15	03
Hammer-head Shark's Egg.	35	09
Fiorida Sea Urchin	25	04
Red-spined Sea Urchin	35	20
Green-spinned Sea Urchin.	35	20
Mammoth Calif. SeaUrchin	50	18
Brown-spined Sea Urchin	35	15
Atlantic Starfish	15	04
Large Bahama Starfish	75	35
Calif. Starfish	25	18
Black Bahama Starfish	35	19
Cracker Starfish	1 00	41
Sunflower Starfish	1 25	60
Heliaster Kubingii	75	30
Nidorella Armata	75	22
Sun-dial Starfish	75	30
Serpent Starfish	85	35
Sea Beaver	50	22
Heart Beaver	75	35
Sea Biscuit	50	16
Club-spined Urchin	35	14
White Branch Coral	25	04
Propeller Coral	50	16
Pink Coral, large spray	25	11
Honey Comb Coral	25	09
Lace Coral	25	09
Eye Coral	50	18
Rose Coral	10	04
Mushroom Coral	35	18
Bud Coral	1 00	21
Venus Flower Basket	1 50	90
Branch Coral (fine clump).	2 50	1 00
Sea Horse	25	18
Sea Pen (very rare)	1 00	30
Pipe Fish (very rare)	1 00	35
Sea Fan	25	10
Orange Sea Fan	75	28
Mounted Sting Ray	5 00	1 90
Horse Shoe Crab	35	18
Keyhole Urchin	25	08
Sawfish Saw, 3ft PERFECT	6 00	4 00

LAND CURIOSITIES.

	Regular	Cut
Horned Toad, in box	$1 00	$ 40
" " on orange-wood plaque	1 00	45
Tarantula in box	75	35
Scorpion, in box	75	35
Pueblo Idol, perfect	2 00	75
Pueblo pottery, 3 in	50	18
Mex. Indian Pottery	50	18
Sioux Steel-pointed Arrow.	50	18
" Beaded Knife Sheath	75	40
" Tobacco Pouch	75	40
" Totem	1 00	45
" Moccasins	3 00	1 50
" War Club	5 00	3 50
Navajo Bow and Arrows	8 00	3 00
Emu Egg	2 50	1 75
Ostrich Egg	1 50	1 00
Mounted Wood Duck (fine)	10 00	2 00
" Snowy Owl	15 00	5 50
" Cardinal	2 00	75
" Grey Squirrel	5 00	2 00
" HoodedMerganser	8 00	3 00
" English Sparrow.	1 50	50
Ancient Costa RicaPottery, very rare		2 50

NOVELTIES.

	Regular	Cut
Palmetto Fan	$ 50	$ 20
Shell Stamp Box	35	18
Pearl Glove Buttoner	35	20
" Pen Holder and Paper Knife combined	50	28
Cat's Eye Stick Pin	35	12
Double Satin Spar StickPin	35	12
Brazil Beetle Stick Pin	1 00	50
Initial Stick Pin	25	04
Palmetto Fly Brush (fine)	1 00	50
Lizard Skin Double Purse, Ladies (fine and dur'ble	2 00	75
Pearl Pin Tray	35	20
Carved Bone Pen Holder and Paper Knife	50	15
Shell Napkin Ring	25	20
Metal Dog or Cat Paper Weight, fine	75	25

NATURAL SCIENCE NEWS

VOL. I. No. 26. ALBION, N. Y., JULY 27, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

THEY ARE ALIVE. What? Those new Mexican Horned Toads I have for sale? They are clean, entirely harmless, easily domesticated, require little attention and are a rare curiosity in the northern states. Pair by express $1.00; single specimen 75c. P.P. FODNA, Grand Island, Neb. N

FOR SALE:—The following first-class specimens for $1.00 Money Order: Fifty assorted arrowheads, one axe, one celt, three knives, two pestles. Cash with order. JAMES B. ROBBERTS, CliftonSprings, N. Y.

TO EXCHANGE:—Sets and singles for sets not in my collection. Also Bb cornet or auto-harp, both in good condition, to exchange for a mandolin in good condition. CLARENCE HARTINGER, Alden Iowa.

FOR SALE:—A new L. C. Smith twelve-gauge double barreled gun. Factory price $55. Will sell for $22. Address A. D. DuBOIS, 327 So. Doyle Ave., Springfield, Ill.

EXCHANGE:—Will give cash or best exchange for set of Columbians, dollar values, used or unused. Must be fine. Enclose stamp. HARRY H. ELLS, Charlotte, Mich.

EXCHANGE:—Sets, 1-4 Barred Owl, 1-5 Screech Owl, (one cracked) 1-5 Albino Bluebird (one chipped) and one male Shoveller mounted, for best offer of two or more good tennis racquets, or cash. Will trade all or part. Write. D. F. HALL, 804 N. Division St., Creston, Ia. O.

FOR SALE OR EXCHANGE:—Sets or singles American Coot and Pied-billed Grebe for best offer in sets of rare eggs or ½ price in cash. Will have some 30 days. W. C. THOMPSON, Canton, Ill.

BICYCLE for sale or exchange:—A Crescent wheel, cost $100, as good as new except the cushions. Have had the wheel some time but as there are no good roads here have used it very little. I will take $50 cash for it or exchange for Baltimore or Columbian hand press and first-class Roman type. Address D. S. EBERSOLD, Oceanus, Brevard Co., Fla. 26-4t

FOR SALE OR EXCHANGE:—35 1st class bird skins, mostly from Rocky Mountains, including Golden Eagle, Blue Grouse, Magpie, 3 Mt. Jays, 2 Water Ouzels, etc. Will sell cheap for cash or exchange for rifle or kodak. JONAS ROBINSON, 29 N. Madison St, Iowa City, Ia. 26-2t

CANOE:—Fast cruising canoe for two persons. Copper rivetted throughout, copper air tanks fore and aft, 6 ft. cockpit, mahogany hatches, patent folding centreboard, oak rudder and deck steering gear. The metal fittings are nickel plated. Both fore and aft sails with complete sailing attachments. Pair of spoon oars and one double-bladed paddle. Everything as good as new. Cost $135. If sold before August 1st will take $35. Complete description for stamp. L. V. CASE, Naples, N. Y.

PARKER HAMMERLESS:—Damascus steel barrels, 12 gauge, cost $80; to exchange for pneumatic safety 1894 or 1895 pattern, 35 lbs. or less, combination preferred. O. B. WARREN, Palmer, Marquette Co., Mich. 26-2t

□ THE NATURALIST'S Directory for 1895, cloth bound, for a collection of Confederate money. JOHN W. NEVEIL, 2317 Sepina St., Phila., Pa.

WANTED.—Good Agates, Minerals and Indian Relics. Will give in exchange good Bird Skins. HARRY S. MOODY, 119 Mentor Ave., Painesville, O. O.

A PAIR of young Flying Squirrels for best offer in Indian Relics or Minerals. Also have Cone in Cone, Moonstones and Snake Rattles for exchange. E. J. GARLOCK, 1602-20 St. Des Moines, Ia.

WANTED.—Fossils, Minerals and stamps. I have Books, pressed Sea Mosses, identified Shells, Fossils, Eggs, etc. Correspondence desired. All letters and postals answered. ALLEN J. REYNOLDS, Box 802, Connersville, Ind.

A FINE Collection of stamps, catalogued at $35 or over, to exchange for a good second-hand Clarionet or Trombone. G. W. BAILEY, 23 Oxford St., London West, Ont.

SIX DOLLARS will buy 268 Varieties of foreign and native woods; 126 of these are Japanese woods from the foresty department of Tokio, Japan, or will exchange for woods not in my collection. Correspondence solicited. LOUIS W. HAHN, P. O. Box 360, Silver Creek, Chautauqua Co., N. Y.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

WANTED at once an A No. 1 adult skin of Bald Eagle and eggs of Hooded Merganser and Swallow-tailed Kite, singles or sets. Address stating best cash or exchange price. FRANK H. LATTIN, Albion, N. Y.

WANT fresh skins of any young Plover or Sandpiper in the down. Cash or good exchange offered. CHAS. K. REED, Worcester, Mass.

BICYCLE WANTED.—Must be in good condition in everyway, offer good exchange in fine mounted specimens, shells, &c. Give description, kind, condition, price wanted, &c. CHAS. K. REED, Worcester, Mass.

T PERCHES FOR SALE.—I have on hand 15,000 small T perches 3 inch base. I wish to dispose of these at once and in order to do so have put the price clear down to hard pan. Oak finished 5 cents each; pine, painted white, 4 cents each; pine, not painted, 3 cents each. All sizes will be turned to order. Sample sent prepaid for 10 cents in stamps. E. L. HALEY, Phillips, Me.

TO EXCHANGE.—Identified Fossils, Shells, Eggs, etc. I want Fossils, Minerals and Stamps. Correspondence desired. All letters and postals answered. ALLEN J. REYNOLDS, Box 802, Connersville, Indiana.

FOR SALE.—The following first class sets collected this season. 261 1-4 1-4 1-4 1-4 1-4 at 10 cents per egg. 305 1-8 1-13 at 6 cents per egg. 337 1-3 1-2 1-2 at 15 cents per egg. 701 1-4 at 25 cents per egg. 501 1-6 1-5 1-5 at 3 cents per egg. 373 1-4 at 15 cents per egg. 598 1-4 at 2 cents per egg. 333 1-4 at 10 cents per egg. B. A. TOMLINSON, Alden, Iowa.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

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If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large, movable water drops, as large as peas: **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

Rutilated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Columbite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Octahedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address,

J. H. RUGG,

Box 262. **Blairsville, Pa.**

Birds Eggs in Sets.

	Per Egg.
King Rail, 1-7, 1-11, 1-12	$ .10
Green Heron, 1-3, 1-4	.06
American Woodcock, 1-3 (not quite first-class)	.50
Acadian Flycatcher, n-3	.10
Blue Grosbeak, n-4	.15
Indigo Bunting, 1-3	.06
Cardinal, 1-3	.05
Bachmans Sparrow, 2-4 (not first-class)	.25
Pine Warbler, n-3, n-4	.25
Yellow-breasted Chat, 1-3, 1-4	.05
Maryland Yellowthroat, 1-2	.08

All first-class, except where noted, with full data.

Birds Skins, Mammal Skins, Reptiles, and Batrachians.

H. H. & C. S. BRIMLEY,

RALEIGH, N. C.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs,** including *Falco tinnunculus,* etc., etc.

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INSTITUTION FOR NATURAL HISTORY

Emdener-Str. 4, Berlin, N. W., Germany.

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"AMERICA'S GREATEST RAILROAD."

NEW YORK CENTRAL

& HUDSON RIVER R. R.

THE FOUR-TRACK TRUNK LINE.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....		8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00

No Collection Complete without one of my

Trap-door Spider Nests!

(Usually sold as Tarantula Nests.)

Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only **50c.** Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

G. W. TUTTLE,

19tf-o PASADENA, CALIF.

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SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

I have recently found some white **Chalcedony Geodes** in the Bad Lands, South Dakota that are different and more elegant than any I ever saw from any part of the world. They are rarities, in size from a hen's egg to a goose egg and lined with brilliant sparkling, frost-like white crystals; a few amethystine tinted and a few with transparent selenite, and others like snow. I will send them postpaid for 25, 35 and 50 cents. Small ones unopened 10 and 15 cents.

You never had any Geodes in your collection as handsome.

Minerals from all parts of the world, especially the Black Hills and the west.

Cheyenne River **Fossils.**

Indian Buckskin Relics and **Weapons** from many nations.

Shells, Indian Photos of a hundred leading chiefs.

Send stamp for priced catalogue.

Natural History Establishment of

L. W. STILWELL,

Deadwood, S. D.

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

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If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).

35 cents postpaid.

"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

CHAS. K. REED,

Naturalist and Taxidermist,

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A specialty made of fine work on Fish and Game Heads or Large work of all kinds.

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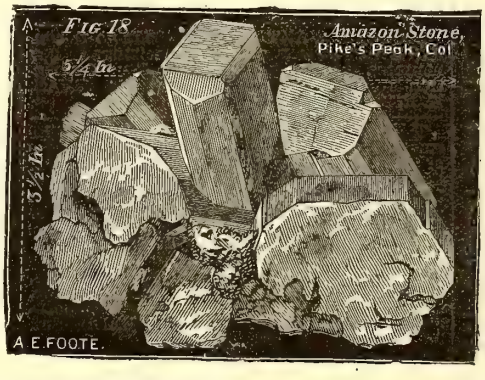

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Natural Science News.

VOL. I ALBION, N. Y., JULY 27, 1895. No. 26

Natural Science News.

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FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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July Insects.

During mid-summer the bees and wasps are very busy building their nests and rearing their young. The Humble bees, late in June and the first of this month, send out their first broods of workers, and about the middle of the month the second lot of eggs are laid, which produce the smaller-sized females and males, while eggs laid late in the month and early in August, produce the larger-sized queens, which soon hatch. These hibernate. The habits of their peculiar parasite, *Apathus*, an insect which closely resembles the Humble bee, are still unknown.

The Leaf-cutter bee (*Megachile*) may be seen flying about with pieces of rose-leaf, with which she builds, for a period of twenty days, her cells, often thirty in number, using for this purpose, according to Mr. F. W. Putnam's estimate * at least one thousand pieces! The bees referred to "worked so diligently that they ruined five or six rose-bushes, not leaving a single unblighted leaf uncut, and were then forced to take the leaves of a locust tree as a substitute."

The Paper-making wasps, of which *Vespa maculata*, the "White-faced wasp," is our largest species, are now completing their nests and feeding their young with flies. The Solitary wasp (*Odynerus albophaleratus*) fills its earthen cells with minute caterpillars, which it paralyzes with its poisonous sting. A group of mud-cells, each stored with food for the single larva within, we once found concealed in a deserted nest of the American Tent caterpillar. Numerous species of Wood wasps (*Crabronidæ*) are engaged in tunnulling the stems of the blackberry, the elder and syringa, and enlarging and refitting old nail holes, and burrowing in rotten wood, storing their cells with flies, caterpillars, aphides and spiders, according to the habit of each species. *Eumenes fraterna*, which attaches its single, large, thin-walled cell of mud to the stems of plants, is, according to Dr. T. W. Harris, known to store it with Canker worms. *Pelopœus*, the Mud-dauber, is now building its earthen cells, plastering them on old rafters and stone walls.

The Saw flies (*Tenthredo*), etc., abound in our gardens this month. The *Selandria vitis* attacks the vine, while *Selandria rosæ*, the Rose slug, injures the rose. The disgusting Pear slug-worm (*S. cerasi*), often live twenty to thirty on a leaf, eating the parenchyma, or softer tissues, leaving the blighted leaf. The leaves should be sprinkled with a mixture of whale-oil soap and water, in the proportion of two pounds of soap to fifteen gallons of water.

Among the butterflies, *Melitæa Ismeria*, in the south, and *M. Harrisii*, in the north, are sometimes seen. A second brood of *Colias Philodice*, the common sulphur-yellow butterfly, appears, and *Pieris oleracea* visits turnip patches. It lays its eggs in June, on the leaves, and the full-grown, dark-green, hairy larva, may be found in August. The *Pieris rapæ*, or imported cabbage butterfly, is now also abundant. Its green hairy larva is fearfully prevalent about Boston and New York. The last of the montn a new brood of *Grapta comma* appears, and a second b.ood of the larva of *Chrysophanus Americanus* may be found on the sorrel.

The larvæ or *Pyrrarctia Isabella* hatch out the first week in July, and the snuff-colored moth enters our windows at night, in company with a host of night-flying moths. These large moths, many of which are injurious to crops, are commonly thought to feed on clothes and carpets. The true carpet and clothes moths are minute species, which flutter noislessly about our apartments. Their narrow, feathery wings are edged with long silken fringes, and almost the slightest touch kills them.

Among beetles, the various borers, such as the *Saperda*, or apple tree borer are now pairiug and fly in the hot sun about trees. Nearly each tree has its peculiar enemy, which drives its galleries into the trunk and branches of the tree. Among the Tiger beetles, frequenting sandy places, the large *Cicindela generosa* and the *Cicindela hirticollis* are most common. The grotesque larvæ live in holes in sand-banks.

The nine-spotted Lady Bug, *Coccinella novemnotata* is one of a large group or beetles, most beneficial from their habit of feeding on the plant lice. We also find another enemy of the Aphides, *Chrysopa*, and its eggs mounted each on a long silken stalk, thus placed above the reach of harm.

Among other beneficial insects belonging to the *Neuroptera*, is the immense family of *Libellulidæ*, or Dragon flies. The Forceps-tail, or *Panorpa P. rufescens* is found in bushy fields and shrubbery. They prey on smaller insects, and the males are armed at the extremity of the body with an enormous forceps-like apparatus.—*Packard's Insect Calendar.*

*See "Proceedings of the Essex Institute," vol. iv, p. 105.

Nature.

"There is a pleasure in the pathless woods
There is a rapture on the lonely shore,
There is society where none intrudes,
By the deep sea, and music in its roar:
I love not man the less but Nature more."

How great, how wonderful is Nature! How gloriously; brilliantly, dazzlingly beautiful! How mighty! How strong! What imposing grandeur! What magnificent splendor! What boundless power! Her mighty rivers flowing through the land, her vast oceans, alike so calm and so angry, so serene and so furious, so smiling and so terribly destructive, her ponderous rocks and her gigantic mountains, her fearful volcanoes belching and thundering forth in furious flames, her fairylike clouds floating over land and sea, how wonderful are they. Her trees

and flowers, luxurious in their beauty, providing for the wants of man and animals, clothing old earth in a magnificient garb, how admirable are these! What an innumerable host of animals she possesses—some like the lion and tiger, so fierce and strong and terrible; others like the sheep and cow and horse, useful and gentle, supplying man with food and clothing and aid in his labors, and the birds, whose gorgeous plumage delights the eye, and whose songs fill the woods with music, all the gladness in their little hearts gushing forth from their throats. And then, Nature's most marvellous productions, Nature's triumph, that in which Nature displays her most wonderous abilities—man himself! How beautiful is the structure of his body! So minute, so delicate, and yet so perfect, so inimitable! How great are the workings of his mind! How spacious his intellectual powers! And when this wonderful mechanism requires repair, when the body has lost its most precious treasure—health, where do we go for remedies? Where, indeed, but to Nature! For the diseases inflictcd by Nature, Nature has remedies, if man but knows them.

What beauteous phenomena occur in Naturel. For instance, light, how precious is this bounty. Schiller knew this when he said:

"O, eine edle Himmelsgabe ist
Das Licht des Auges—Alle Wesen leben
Vom Lichte, jedes gluckliche Geschöpf—
Die Pflanze selbst kehrt freudig sich
zum Lichte."

Light, by means of which man can perceive objects millions upon millions of miles away, a distance, a space, so vast, so immeasurable, that the mind of man, though powerful it is, is too weak, too puny, to appreciate its immensity!

And sound, by which man can enjoy music, sweet melodies, soft tunes. But more valuable than this, through its means mankind may be instructed, may obtain knowledge! And electricity, that subtle force which enables man to perform wonders, to undertake enterprises which without its aid would be impossible—to accomplish most gigantic tasks! The spotless snow, the falling rain, supplying the oceans, plants, and man with water, the rattling hail, the rushing storms, lashing the seas into fury, and carrying destruction in their paths, the roaring and crashing thunder and the flashing lightning—how grand these are! What tremendous power controlls the flights of the planets through space! Bodies so incomprehensively immense in size, of such an unimaginably enormous weight, whirled with wonderful speed through a vastness which defies description, and yet so perfectly under Nature's control. How humble, how insignificant is the strength of man compared with these awful powers! How admirably accurate and precise is Nature! How strict her laws are! How bountiful, how lavishing she is! How stupendous are the powers of the elements! Can these things fail to excite admiration? Can they fail to arouse the emotions? Is it strange that men in ancient times, men who knew so little about Nature, is it strange, I ask, that they should look upon her with awe, and suppose her wonderful forces to be controlled and regulated by beings superior to man?

But the mysteries of Nature are yet far from being solved. Truth and enlightenment come gradually. All things in Nature are for a purpose, though man may not yet know what this purpose is. Before man will know all, man will have ceased to exist. But whom have we to thank for all we do know of these marvellous, wonderful, grand and imposing powers? Science, and the indefatigable efforts, the inexhaustible genius of those great and noble and wise men, who upheld and promoted science among humanity, even in the darkest hours of ignorance, when religious insanity threatened to overwhelm it! Science is Truth! Truth is Science! Why and for how long will humanity persist in hiding from truth, from enlightenment?

"No one so deaf as he who will not hear!
No one so blind as he who will not see!"

So long as man will insist upon avoiding the light of science, of knowledge, of wisdom, so long civilization will fail to attain its perfection, so long man will not progress as he should! Study Nature, deeply, profoundly, with all your heart and energy, and you study the most beautiful, the most refining, the most elevating, the most lofty theme that can engage the human mind. Say to yourself, "*Gestio scire omnia!*" and investigate, observe, ascertain. Well may I say with Froude: "The knowledge that a man can use is the only real knowledge, the knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like raindrops off the stones." Here in studying Nature you will find the real knowledge, the true knowledge, the knowledge which you will be a wiser and better and truer man for possessing.

"Delibera hoc, dum ego redeo."

O. A. Dahms,
Davenport, Iowa.

Echoes from Bird Land.

The fashion now is, big sleeves, some time ago it was, tight sleeves. The hair is now worn in a Psyche; not long ago the French-twist was in vogue.

Constantly the fashions change, and without a thought we change with them.

Nearly two decades ago a lady came into an evening gathering with a dead bird on her bonnet. This was something new, a novel idea her admirers said. Without stopping to reflect, with the thought only of self adornment, with the hereditary impulse to adopt every thing new, the fancy was seized upon by those we term the gentler sex, and only when Fashion itself shall be no more will the full extent of the mischief be known. Like a blighting wind it has passed from continent to continent, and before its ruthless blast, into the millinery depots of our great cities are annully swept *one hundred million* victims. Does it mean any thing to us that our birds are thus slaughtered? Ask the witnesses. The New England fruit grower replies: "Plums and peaches once grew abundantly in New England, now their growth is practically impossible; insects too abundant to be kept down by the *decreasing number of birds*, ruin our trees."

The observing farmer witnesses, "I would rather a man would shoot my best dog than the covey of quails which live on my farm, so destructive are they to obnoxious grubs and insects." Prof. Fisk of Buffalo says: "It is estimated that birds save annually to agricultural purposes alone over $100,000,000 in the United States."

From the sea shores and the forests, from the rivers and the mountains comes the wail of our little suffering friends as if they say; "Aid us, or we perish." Can we afford to have our land depopulated of the feathery tenants of field and river?

The otherwise kind hearted wo-

man whom we meet every day on the streets wearing in her bonnet the skin or feathers of a bird, does not as a rule know of the cruelty practiced in procuring these adornments. Many varieties of water birds acquire their fine plumes only during the nesting season. It is at this period while the parents are engaged in caring for their young that their rookeries are sought out and the birds heartlessly slaughtered. The Least Tern, one of our most beautiful sea birds, once nested on Cobb's Island, Va., in countless thousands. Three years ago I visited the island with the hope of securing a specimen for our Cabinet of Natural History. Although I remained ten days on the island, only one bird was seen and it fled in terror when it discovered that it was a man it saw on the beach and not a piece of drift wood. "Ten thousand of these birds were killed and shipped to New York in a single season and their eggs and youug left to rot in the sand," said the light-house keeper. The delicate white plumes which are so much seen on ladies' bonnets grow on the back of the large white Egret. These appear *only during the nesting period.* One day in Florida I came upon a large rookery of these birds and shall long remember the scene. The air was filled with the screams of young birds pleading for the food which their dead mothers could never bring. The buzz of green flies here and there in the swamp marked the spots where the plume hunters had shot down their victims. The plumes were stripped from their backs in sight of the young which now must starve that our women may adorne themselves. This terrible slaughter can be checked only by our true women who as they become acquainted with the horrible cruelties practiced in procuring birds, cease to wear aloft the mangled remains of the little innoceuts and use their influence on behalf of those creatures which can not speak for themselves.

T. Gilbert Pearson,
Guilford College, N. C.

The Coloring of Butterflies.

The purpose of the coloring of butterflies is entertainingly told by Dr. C. F. Marshall. The color ot animals and plants is no accidental quality. It is intended in different ways to benefit its possessor in the struggle for existence. In the case of flowers it has been shown that the colors and scent serve to attract insects which fertilize them. Therefore, if insects can appreciate the colors of the various flowers, they must be able to distinguish colors in the members of their own and other species. The colors of butterflies may be divided into four main groups—protective colors, warning colors, sexual colors and the colors of mimicry. The protective colors enable the butterfly to escape from its enemies, owing to the coloring bearing a strong resemblance to some other object and thus aiding concealment. The resemblance may be to another butterfly, or to a flower or a leaf. Protective coloring is usually confined to the under surface of the wings, which is colored more or less like the leaves of flowers on which the butterfly preferably alights or perches. When the wings are folded up exposing the under surface only, the protection is often very striking. In different specimens resemblances may be found to dead leaves in almost every stage of decay. The "leaf insect" resembles a bunch of leaves, and it is hard to tell the "stick insect" from a group of dried twigs. The larvæ or caterpillars of butterflies, being soft-bodied, defenseless creatures, are also protectively colored. The usual color of the caterpillars is green, the color of the leaves on which they feed. Caterpillars which have the habit of feeding on grass are protected by longitudinal strips, which facilitate concealment. At the time when the larvæ are about to change into the chrysalis stage they usually turn a brown color, resembling the earth, to which they descend. Warning colors form a remarkable group of instances in which the colors are conspicuous for the purpose of warning other insects to keep away. Warning coloring arises from the fact that if an animal, liable to be eaten by others, has a nauseous taste it is advantageous that it should be quickly recognized, and hence avoided by the animals which would otherwise eat it as food. The butterflies possessing warning color are generally brightly colored on both surfaces of the wings, and they excrete juices of a powerful odor, which are offensive to insect-eating animals. In sexual coloring the more brilliant colors of the male are explained by Darwin as meeting the preference of the female for a more brightly colored mate, but Wallace attributes the more sober hues of the female to the necessity of escaping detection at the critical egg-laying period. One of the most curios points in the coloring of insects is that many butterflies escape destruction by mimicking the colors and markings of the uneatable forms. A large number of cases are known in which an edible butterfly mimics an inedible and nauseous one, protected by its warning colors so closely that in many cases it would be considered a member of the same species. This resemblance is sometimes so close as to deceive the butterflies themselves, and the male of the mimicking butterfly has been seen pursuing the female of the mimicking species unaware of his mistake until he was very close to her.—*Chicago Record.*

The Nest of the Trap-door Spider.

The Trap-door Spider (*Mygale henzii*, Girard) is widely diffused in California. While wandering over the Mesa (table lands), just back of this city a few months ago I was struck by the great number of their nests in favorable localities. In the adobe land hillocks are numerous; in fact, in many places, they are as thick as the ground will permit. They are about a foof in height, and some three or four feet in diameter. These hillocks, which are an interesting formation in themselves, are selected by the spiders, apparently, because they afford excellent drainage, and cannot be washed away by the winter rains. Their stony summits are often as full of spider's nests as they well can hold. These subterranean dwellings are shafts sunk vertically in the earth, except where some stony obstruction compels the miner to deflect from a downward course. These shafts are from five to twelve inches in depth and from one-half to one and a half inches in diameter, depending largely upon the age and size of the spider.

When the spider has decided upon a location, which is always in clay, adobe or stiff soil, he excavates the shaft by means of the sharp horns at the end of his mandibles, which are his pick and shovel and mining tools. The earth is held between the mandibles and carried to the surface. When the shaft is of the required size, the spider smooths and glazes the wall with a fluid which is secreted by herself. Then the whole

shaft is covered wifh a silken paper lining, spun from the animal's spinnarets.

The door at the top of the shaft is made of several alternate layers of silk and earth, and is supplied with an elastic and ingenious hinge, and fits closely in a groove around the rim of the tube. This door simulates the surface on which it lies, and is distinguishable from it only by a careful scrutiny. The clever spider even glues earth and bits of small plants on the upper side of his trap-door, thus making it closely resemble the surrounding surface.

The spider generally stations itself at the bottom of the tube. When, by tapping on the door, or by other means, a gentle vibration is caused, the spider runs to the top of his nest, raises the lid, and looks out and reconnoitres. If a small creature is seen, it is seized and devoured. If the invader is more formidable, the door is quickly closed, seized and held down by the spider, so that much force is required to pry it open. Then, with the intruder looking down upon him, the spider drops to the bottom of the shaft.

A young friend of mine has spent much time lately watching and investigating the operations of this spider. He found by many experiments—all with the same result—that when the door of his nest is removed, the spider can renew it five times—never more than that. Within these limitations, the door torn off in the evening was found replaced by a new one in the morning. Each successive renewal showed, however, a greater proportion of earth, and a smaller proportion of silk, until, finally, the fifth door had barely enough silk to hold the earth together. The sixth attempt, if made, was a failure, because the spinnarets had exhausted their supply of the web fluid. When the poor persecuted spider finds his domicil thus open and defenceless, he is compelled to leave it, and wait until his stock of web fluid is renewed.

From forty to fifty cream-colored spiderlings are hatched from the yellow eggs at the bottom of the nest. When these have attained only a fraction of their full size—before they are half grown—their affectionate mother drives them out into the world to shift for themselves. After a brief period of uncertainty, they begin active life by making nests, each for itself, generally close to "the old homestead," sometimes within a few inches of it. These nests are always shallow and slender, and are soon out grown. When the spider attains its full size it constructs a larger nest.

The spider is seldom seen outside of its nest, which it rarely leaves—during the day, at least, and then only for a few minutes, and for a short distance. Upon any alarm, it hastens to its nest, lifts the door, which quickly springs back into its place, and is held down by the householder until the alarm has subsided.

I now have a large nest, containing a mother and her yellow spiderlings, which I am carefully watching and studying.—*D. Cleveland, San Diego, Calif. in Science.*

A Fish's Bladder.

Naturalists long ago studied the composition of the gas contained in the swimming bladder of fishes and discovered that it consists of the principal constituents of the air—namely, oxygen, nitrogen and carbonic acid. But these constituents are not mingled in the fish's balloon in the same proportions as they are in the atmosphere, and besides their proportions do not remain always the same in the fish. Sometimes the bladder contains hardly any oxygen; at others oxygen constitutes nine-tenths of the whole contents.

The variation in the quantity of oxygen is somewhat mysterious, and naturalists have offered several different suggestions as to the cause of it. Some think the fish may be able to control the quantity of oxygen in the bladder by its own will. Biot, a distinguished French naturalist, thought he had solved the problem by discovering that the proportion of oxygen was larger in fish that lived at great depths and smaller in those that lived near the surface of the sea.

But quite recently new observations made from the Prince of Monaco's yacht, Princess Alice, seem to prove that Biot was mistaken and that the deep dwelling fish carry no more oxygen in proportion than do those living in shallow water. Some of the fish whose swimming bladders were examined by the naturalist on the Princess Alice came from a depth of no less than a mile.

They were compared with fish which seldom descend below 200 feet in depth and with others which prefer a depth of about 500 or 600 feet, and all had nearly the same proportion of oxygen to aid them in swimming.

The variations mentioned above seem therefore to depend upon some other cause than the depth of the fish's dwelling place.

It is these unsettled questions that offer to young naturalists some of their most brilliant opportunities for distinction. It is a great mistake to suppose that there does not remain a plenty of room for discovery in science.—*Youth's Companion.*

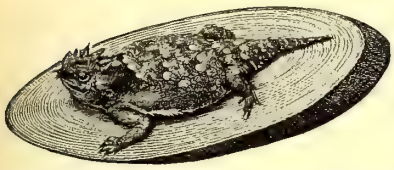
The Poison of the Ornithorhynchus.

The hind feet of the ornithorhynchus; "the mole with webbed feet and the bill of a duck" that puzzled zoologists so much for a long time, are provided with a solid spur connected with a gland. Have we here a poison gland? From some apparently trustworthy accounts that have reached him, Mr. Stewart thinks we have. This gland is at least venomous at a certain season. A dog was wounded by one of these spurs three times, and the symptoms the first time were those of pain and somnolence, but there were no convulsions, titubations or trembling. Upon the other two occasions, the symptoms were less pronounced, and even null, thus indicating habituation. The poison has proved mortal to the dog in four cases, but in man the symptoms disaappear without causing death.—*Scientific American.*

The Arawaks.

In the Port Royal Mountains, Jamaica, an interesting archæological discovery was recently made of a cave containing the skeletons of at least twenty-four of the aboriginal Arawaks. When Columbus discovered the island in 1494 the Arawaks were estimated at about 600,000. A century and a half later, on the capture of Jamaica by the English, they had completely disappeared, even to their bones, as only the skulls until now had been found. These showed a frontal depression with lateral expansion, an artificially formed deformity that is also found in those just discovered, which are of all ages. A shattered canoe of cedar wood, 7 feet long and 1½ feet wide, an arborvitæ mortar, and two earthenware vessels were found with the skeletons.—*Scientific American.*

HORNED TOAD,
Phrynosoma.



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NEW HOME

It has **Automatic Tension, Double Feed,** alike on both sides of needle (*patented*), no other has it; New Stand (*patented*), driving wheel hinged on adjustable centers, thus reducing friction to the minimum.

WRITE FOR CIRCULARS.

THE NEW HOME SEWING MACHINE CO.

ORANGE, MASS. BOSTON, MASS. 28 UNION SQUARE, N. Y
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Large Resurrection Plants,

By mail, 10c. Small, 5c. G. W. TUTTLE,
19tf-o Pasadena, Calif.

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Collectors of
Florida Sea Shells and Curios.
Bird Skins and Eggs a Specialty.
PRICE LIST FURNISHED FOR STAMP.
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MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,
Mfr of Rubber Stamps,
117 Clifton Street, Rochester, N. Y.

RARE SPECIES

Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

Natural Science News.

ADVERTISING RATES.

Only 5c per norpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

100 lines	4½c	per line.
200 "	4	"
300 "	3½	"
500 "	3	"
1000 "	2½	"
2000 "	2	"

A column contains 120 lines; a page, 360.

A little two-line ad. would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

A small one inch ad. run one year would use 624 lines and would entitle the purchaser to the 3 cents per line rate, and cost only 36 cents per issue.

A 3¼ inch ad. run one year would use 2,028 lines and would entitle the purchaser to the 2 cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

Florida Coast Shells
at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

We therefore make you the following offer: From now until October first we will fill all small orders for Sea Shells at very little more than the actual cost of packing and postage.

We will fill any order from ten cents to $2, and give you a finer and larger collection for the money than you ever had before.

We have large quantities of Florida coast and river shells, and we take this method of reducing our stock before the autumn collecting begins.

Unless otherwise ordered we will send a general assortment, and each purchaser, whether large or small, will receive some fine and rare shells.

Send registered letter, currency or stamps.

Address,

The Ebersold Family,
Oceanus, Brevard Co., Fla.

For a short time only, we will sell *Buffalo Horns* nicely polished and mounted at from $1.50 to $3.00 per pair. Address, GILLBERT BROS. & GRIFFEN, Taxidermists, 1519 Leavenworth St., Omaha, Neb. 24-13t.

YOU CAN GET YOUR PRINTING

a little **CHEAPER** or a little **BETTER** by sending to **A. M. EDDY, ALBION, N.Y.** A specialty of natural history printing, catalogues, books, magazines &c. 100 envelopes, 100 letter heads and 100 cards, all for 100 cents. Send for samples of our printed stationery. 9

R-I-P-A-N-S
ONE GIVES RELIEF.

WHAT NEXT?

In last week's issue we almost "gave away" a fine lot of Bird Skins, etc.; now look at the bargains in Fossils, all correctly named, and fine Specimens. Watch for our ad., as we promise sensations in the Curio line soon.

Fossils at Cost Price.

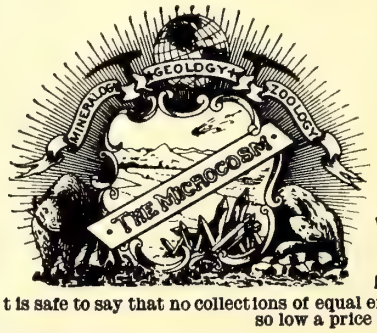
Calymene senaria, extra fine	$ 40
" " good	22
" " poor	10
Shark teeth, Va., very large	07
" medium	04
" small	02
Fish, slightly cracked, 6 in	1 13
Pentremites godonii large	12
" " small	04
Baculites, Black Hills, 5½ in. extra fine	1 08
" " " 1½	25
Scaphites nodosus, large	1 00
" " fine, medium	45
" " " small	12
" " poor, small	03
Nautilus Dekayi, Black Hills, 2 in	45
Placeticeras placenta, Black Hills, 3½ in	50
Inoceraminus Bad Lands, 3½ in	33
Tooth of *Elotherium*, Bad Lands, 3 in	50
" *Aceratherium* " 2½ in	62
" *Titanotherium* fine, 2½x3in. rare	1 64
Testdo fossil turtle, 3¼ in. Bad Lands	1 88
Fossil turtle's egg 2in, Bad Lands	42
Gasteropod, 2¾ in, very fine Bad Lands	47
" 2½ in. other fossils in same piece	66
Anchura americana, single specimen	05
" " small clump	23
" " large clump	47
Belemnites densus, Black Hills, 2½ in	17
" *mucronata*, N. J., 2½ in	31
Calamite, 8in curved., diam. 4in. weight 3½ lbs., by express	3 98
Calamite, 6 in.; diam. 2½ in.; extra fine	1 48
" 4 in., fair	44
" 3 in.	22
Zoophyte, Ohio, 2 in., good	40
" " 2 in. with *Orthis*	53
Mazon Creek fossil fern, *Pecopteris unita*	27
" " " leaf, *Neuropteris decipiens*	28
Fossil leaf, *Aralia*, very fine; 5 in. by express	1 15
Lepidodendron elegans, from the coal measures of Penn., very fine and rare, 11x8 in	3 25
Lepidodendron cuspidatum, Pittston, Penn. 10x5 in	1 50
Lepidodendron clypeatum, Youngstown, Ohio, 5½x3½ in	81
Neuropteris Clarksonii and *Alethopteris robusta* on one piece, 10½x8 in	1 78
Pseudopcopteris anceps, 9x6 in. Cannelton, Penn., very fine fossil fern	1 82
Two unnamed fossil ferns from Pittston, Penn., each	75
Very fine group of *Alethopteris* from Eng., 7½x4½	1 46
Fossil fern, small	28
Athyris reticularis, Indiana	05
" *vittata*, "	15
" *subtilita*, Illinois	03
" " large	05
" *lammellosa*, large, Kentucky	35
Nucleocrinus vermuilli, Ohio	50
Trigonocarpus triloculare, Youngstown, O.	09
Same,	16
Pleurotomaria lenticularis, N. Y	40
" *sucomargnata*, N. Y	35
Cyclomena fluctuosum, Ohio	40
Atrypa reticularis, Indiana	35
Spirifer perroni, "	35
" *eurunites*, "	30
Rhynchonella capax, Ohio	06
" " extra large	15
" " Indiana	05
" *dentata* "	06
Orthis biforata "	05
" *testudinaria* "	05
Stenoschisma tethys "	07
Zygospira modesta "	05
Strophomena, large "	16
" fine "	10
" *planumloua* "	07
Venus sp. (?) N. Y	10
Arthrophycus Harlanii, fucoid, fine	1 00
Anchycrocrinus bulbosus, fine	26
Three fine crinoids on one piece, *Barycrinus hoveyi*, *Scaphiocrinus unicus*, rare, *Platycrinus hemisphericus*, from Crawfordsville, Ind. on the orginal rock, all for	5 50
Platycrinus hemisphericus, 3½x2½ in., very fine on original rock; the largest crinoid in stock	2 58
Same, 2½x1½ in. perfect	1 75
" on artificial mounting with fine *Batocrinus Indianensis*	2 63
Same on artificial mounting with very fine *Scaphiocrinus unicus*	2 16
Cyathocrinus Indianensis, on original rock; single sp	85
Scaphiocrinus unicus, on original rock, single specimen	63
Crinoid stems, extra fine	10
" " extra large, showing manner of branching	18
Crinoidal Limestone, N. Y	04
" " N. Y. large sp	10
Red Crinoidal Limestone, Indiana	06
" " " " large	25
Turrillite, fossil screw, extra	12
" " " medium	07
" " " small	04
Turritella, stair shell, rare	04
Fossil sea urchin; Texas, large	10
" " " " medium	06
" " " " small	03
Fossiliferous limestone, *Orthis*, Ind	20
" " *Rhynchonella*	15
Tongue-shaped, Fossil shell, Bad Lands	75
Very large " " " "	85
Lingula Sandstone, fine specimens	15
" " small specimens	04

FOSSIL CORALS.

Chaetestes Dalei, Indiana	08
" *Sigallanoides*, Indiana	06
" *petripolitanus*, "	08
Heliophyllum Halli, large	20
" " medium	10
" " small	03
Acrophyllum Oneidaense, Ohio	47
Hadrophyllum De Orbignyi, Ind	18
Arcevularia, Davidsoni, polished	25
" " extra	50
" " Mich	20
Favorsites, canadensis polished	40
" petoskey, Mich	16
" *goldfussi*, white	57
" " small	10
Peculiar fossil coral, Ohio, 4½x4 in	58
" " " Kan. 7 in	75
" " " odd shape	47
Lake Ontario fossil branch coral	16
" " " " large cluster	75
Fossilized Bone, phosphate beds, 8 in	31
" " " " 3 in	13
" " " " 1 in	05

Every specimen is just as represented and will be sent prepaid at prices quoted. Large ones must go by express. The crinoids are especially desirable. Address,

ERNEST H. SHORT, Albion, N. Y.



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Systematic Collections,

FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

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t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C.

NATURAL SCIENCE NEWS

VOL. I. No. 27. ALBION, N. Y., AUGUST 3, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED.—A. O. U. No's 3, 13, 32, 77, 106, 378, 457, 475, 501, 511, 713 and others will offer sets, relics, minerals, curios, old books, some on Natural History. ARTHUR H. MILLS, West Rutland, Vt.

TO EXCHANGE.—1 fine dissecting knife and one pair of dissecting tweezers for Indian Relics worth one dollar. A good bargain. LEWIS BUSSEY, Mayfair, Ill.

LOOK! The curious Ivory Sea Apple for only 35c or I will send one in exchange for Indian relics worth as much. LEWIS BUSSEY, Mayfair, Illinois.

WANTED.—A good sounding second-hand guitar in exchange for first-class sets or will pay part cash. Instrument must be in good condition. All letters answered. H. L. HEATON, Parkville, Missouri.

WANTED.—A good fishing pole, Sweater and Books on Ornithology. Will exchange Hawk and Owl skins and birds eggs with data. HOMER R. DILL, Gardiner, Maine.

WANTED.—Skins of 477, 478, 479, 480, 482, 483, 484, 484b, 485, 491, 536, male and female. Offer skins of this locality in exchange. Also eggs in sets for skins. P. K. GILMAN, Box 322, Palo Alto, Cal.

WANTED.—Good skin of Pacific Pocket Gopher with skull attached. Must be from Wash., Ore., or N. Calif. Will give good exchange or cash. Address ERNEST H. SHORT, Albion, N.Y.

CAL. MURRE EGGS.—Will parties who ordered from me in ex. 30a eggs. now correspond as I am ready to make my exchanges. These eggs wont hold out very long so write soon. T. E. SLEVIN, 2413 Sacramento St., San Francisco, Cal.

BICYCLE for sale or exchange:—A Crescent wheel, cost $100, as good as new except the cushions. Have had the wheel some time but as there are no good roads here have used it very little. I will take $50 cash for it or exchange for Baltimore or Columbian hand press and first-class Roman type. Address D. S. EBERSOLD, Oceanus, Brevard Co., Fla. 26-4t

FOR SALE OR EXCHANGE:- 35 1st class bird skins, mostly from Rocky Mountains, including Golden Eagle, Blue Grouse, Magpie, 3 Mt. Jays, 2 Water Ouzels, etc. Will sell cheap for cash or exchange for rifle or kodak. JONAS ROBINSON, 29 N. Madison St., Iowa City, Ia. 26-2t

PARKER HAMMERLESS:—Damascus steel barrels, 12 gauge, cost $80; to exchange for pneumatic safety 1894 or 1895 pattern, 35 lbs. or less, combination preferred. O. B. WARREN, Palmer, Marquette Co., Mich. 26-2t

FOR SALE.—The following first class sets collected this season. 261 1-4 1-4 1-4 1-4 1-4 at 10cents per eggs 305 1-8 1-13 at 6 cents per egg. 337 1-3 1-2 1-2 at 15 cents per egg. 701 1-4 at 25 cents per egg. 501 1-6 1-5 1-5 at 3 cents per egg. 373 1-4 at 15 cents per egg. 598 1-4 at 2 cents per egg. 333 1-4 at 10 cents per egg. R. A. TOMLINSON, Alden, Iowa.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds," EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

T PERCHES FOR SALE.—I have on hand 15,000 small T perches 3 inch base. I wish to dispose of these at once and in order to do so have put the price clear down to hard pan. Oak finished 5 cents each; pine, painted white, 4 cents each; pine, not painted, 3 cents each. All sizes will be turned to order. Sample sent prepaid for 10 cents in stamps. E. L. HALEY, Phillips, Me.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

WANTED at once an A No. 1 adult skin of Bald Eagle and eggs of Hooded Merganser and Swallow-tailed Kite, singles or sets. Address stating best cash or exchange price. FRANK H. LATTIN, Albion, N. Y.

Our Special Egg List for August.

	Reg.	Spec
Double-crested Cormorant	25	11
Mallard	20	09
Blue-winged Teal	20	08
American Golden-eye	1 25	47
Virginia Rail	20	09
Purple Gallinule	25	10
Killdeer	20	09
Cooper's Hawk	30	13
Flicker	03	01
Kingbird	03	01
Red-winged Blackbird	3 for	01
Meadowlark	10	04
Bronzed Grackle	05	02
English Sparrow	3 for	01
Barn Swallow	05	02
Red-eyed Vireo	10	04
Yellow-breasted Chat	08	03
Catbird	2 for	01
Brown Thrasher	03	01
Mockingbird	05	02
Carolina Wren	10	04
Wood Thrush	06	02
Robin	03	01
American Herring Gull	20	09
" " "	5 for	40

All eggs 1st class and sent prepaid at prices quoted. *Remember* orders under 50c must contain 5c for postage.

This offer positively expires Aug. 30th.

Address ERNEST H. SHORT,
Albion, N. Y.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens. $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

MINERALS and Indian Relics. List for 2c stamp. Isaac S. Kirk, Fremont, Pa. 4yr

Are You a Dealer

IN

Sea Shells,

Manufactured Shell Goods,
Souvenirs, Fancy Goods, &c.?

If so it will pay you to send for our illustrated catalogue.

We make a specialty of **Fair, Resort and Bazaar Goods.**

E. L. FORD & SON, Middlefield, Ohio.

BAKER & HANSON,

Collectors of

Florida Sea Shells and Curios.

Bird Skins and Eggs a Specialty.

PRICE LIST FURNISHED FOR STAMP.

FORT MYERS, FLORIDA.

CALIFORNIA WOODS! Fine collection of California Woods, 20 different varieties cut in plaques, half plaques, &c., each kind stamped with name, mailed for only 75c. These collections include such woods as Orange, Almond, Pomegranite, Prune, Manzanita, Mountain Mahogany, Umbrella, Wild Coffee, &c. G. W. TUTTLE, Pasadena, Calif. 19tf-o

MINERALS,

Ancient Indian Relics, Stamps and Curiosities.

Price List, Postage Free.

W. Perry Arnold, Stonnington, Ct.

"Natural Science News" is a good advertising medium.

If it pays others, why will it not pay you?

My last notice more than paid me my subscription back in sales and exchanges of satin spar. C. E Houdyshell, Holton, Kans.

In reply to my ad. in your valuable paper, I received 235 letters in the months of February and March. W. DEAN, Niagara Falls, N. Y.

I received over one hundred answers to my ad. in the N. S. N. and think it a splendid advertising medium. J. S. Noah, East Liverpool, Ohio.

RARE OLD BOOKS We have in stock or can furnish on short notice books, magazine articles and information on any subject desired. 'Out-of-print' books a specialty. Literary Light $1 a year; sample copy 10cts. Raymer's Old Book Store, 243 4th Ave. S., Minneapolis, Minn.

"AMERICA'S GREATEST RAILROAD."

NEW YORK CENTRAL

& HUDSON RIVER R. R.

THE FOUR-TRACK TRUNK LINE.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

No Collection Complete

without one of my

Trap-door Spider Nests!

(Usually sold as Tarantula Nests.)

Neatly put up in Redwood Pails.

The Spider's Nest of itself is one of the most wonderful specimens of insect architecture in existence, and when neatly set in these beautiful little Pails and nicely decorated with moss they make an ornament to any collection. Sent by mail for only **50c.** Nicely stuffed and mounted Trap-door Spiders mailed for 40c.

G. W. TUTTLE,

19tf-o PASADENA, CALIF.

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SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

I have recently found some white **Chalcedony Geodes** in the Bad Lands, South Dakota that are different and more elegant than any I ever saw from any part of the world. They are rarities, in size from a hen's egg to a goose egg and lined with brilliant sparkling, frost-like white crystals; a few amethystine tinted and a few with transparent selenite, and others like snow. I will send them postpaid for 25, 35 and 50 cents. Small ones unopened 10 and 15 cents.

You never had any Geodes in your collection as handsome.

Minerals from all parts of the world, especially the Black Hills and the west.

Cheyenne River **Fossils.**

Indian Buckskin Relics and **Weapons** from many nations.

Shells, Indian Photos of a hundred leading chiefs.

Send stamp for priced catalogue.

Natural History Establishment of

L. W. STILWELL,

Deadwood, S. D.

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

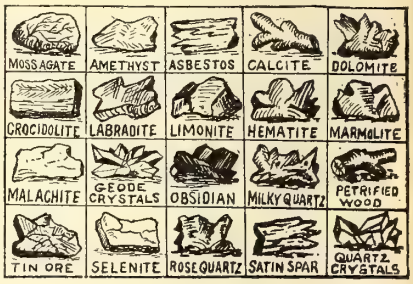
Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).

35 cents postpaid.



"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

CHAS. K. REED,

Naturalist and Taxidermist,

AND DEALER IN

Naturalists' Supplies and Books.

Manufacturer of Oval Convex Glass Wall Shades (Patented).

A specialty made of fine work on Fish and Game Heads or Large work of all kinds.

Fur Rugs and Robes Tanned, Lined and Mounted.

No. 262 Main Street, Worcester, Mass.

DR. A.E. FOOTE,

1224-26-28 North Forty-first Street, PHILADELPHIA, PA., U. S. A.

Minerals, and Scientific Books.

The Largest and most complete stock in the world.

SYSTEMATIC COLLECTIONS, evenly covering the science of Mineralogy.

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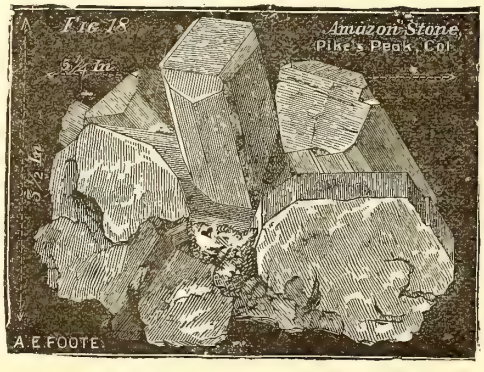
MINERALS FOR LABORATORY and experimental work.

RARE AND CHOICE Cabinet Specimens for Museums and advanced collectors.

ESPECIAL ATTENTION is given to the selection of material for students and investigators in crystallography, microscopy, &c., &c.



Recent Additions to Stock.

CALCITE. In splendid scalenohedrons from one to eighteen inches in diameter, containing *"phantoms" of Marcasite*, some of the larger crystals showing tints of amethystine and honey-yellow color divided by lines of bright Marcasite crystals. 25c to $10.00.

ICELAND SPAR. Where particularly clear or finely colored material was found, we sacrificed crystallization and obtained from parts of large crystals, what are believed to be the most beautiful rhombs of Iceland Spar ever seen. They show perfect transparency save for the exquisite coloring of yellow and various amethyst shades, and the bands of brilliant spear-shaped Marcasite crystals.

The small cleavages at 10c. to 25c. are of quite as fine quality as the cabinet specimens of higher price and make a novel addition to the collection of microscopist or amateur.

Send for our complete list of new arrivals.

Price Lists and Circulars Free.

(In ordering book catalogues, mention the subject in which you are interested.)

"Catalogue of Minerals,"

fully illustrated, 128 pages, 10c; bound, 20c.

DIASPORE CRYSTALS.—All of the resent find made at Chester, Mass., was secured by us. Clear, violet-colored crystals of high lustre and perfect crystallization are implanted on the emery, making specimens of a type new to collectors. None have been found but the few taken out some months ago and our collector informs us that there is little chance of their being found again; $2.00 to $15.00.

Small groups and microscopic specimens, 50c to $1.50.

ZEOLITES FROM OREGON. A new locality rivaling Nova Scotia in the excellence of its *Chabazites, Stilbites, Natrolites, Thompsonites.* A large lot received, containing many beautiful specimens, the groups of Chabazite being especially noteworthy. Also Lorandite. Kylindrite, Caswellite, Emeralds, Onyx, Sphalerite, etc., etc. Boxes of minerals sent for examination.

Always mention NATURAL SCIENCE NEWS *when answering this ad.*

Natural Science News.

VOL. I ALBION, N. Y., AUGUST 3, 1895. No. 27

Natural Science News.

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FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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August Insects.

During this month great multitudes of bugs (*Hemiptera*) are found in our fields and gardens; and to this group of insects the present chapter will be devoted. They are nearly all injurious to crops as they live on the sap of plants, stinging them with their long suckers. Their continued attacks cause the leaves to wither and blight.

The grain Aphis, in certain years, desolates our wheat fields. We have seen the heads black with these terrible pests. They pierce the grain, extract the sap, causing it to shrink and lose the greater part of its bulk. It is a most insiduous and difficult foe to overcome.

The various leaf-hoppers, *Tettigonia* and *Ceresa*, abound on the leaves of plants, sadly blightly them; and the *Tettigonias* frequent damp, wet, swampy places, A very abundant species on grass produces what is called "frog's spittle." It can easily be traced through all its changes by frequently examining the mass of froth which surrounds it. *Tettigonia vitis* blights the leaf of the grape-vine. It is a tenth of an inch long, and is straw-yellow, striped with red. *Tettigonia rosæ*, a still smaller species, infests the rose, often to an alarming extent.

The *Notonecta*, or water boatman, is much like a *Tettigonia*, but its wings are transparent on the outer half, and its legs are fringed with long hairs, being formed for swimming. It rows over the surface in pursuit of insects. *Notonecta undulata*, Say, is a common form in New England.

Another insect hunter is the singular *Ranatra fusca*. It is light brown in color, with a long respiratory tube which it raises above the surface of the water when it wishes to breathe. This species connects the Water-boatmen with the Water-skaters, or *Gerris*, a familiar insect, of which *Gerris paludum* is commonly seen running over the surface of streams and pools.

Reduvius and its allies belong to a large family of very useful insects, as they prey largely on caterpillars and noxious insects. Such is *Pirates picipes*, a common species. It is an ally of *Reduvius personatus*, a valued friend to man, as in Europe it destroys the bed bug. Its specific name is derived from its habit while immature, of concealing itself in a case of dust, the better to approach its prey.

Another friend of the agriculturist is the *Phymata erosa*. Mr. F. G. Sanborn states that "these insects have been taken in great numbers upon the linden trees in the city of Boston, and were seen in the act of devouring the *Aphides*, which have infested the shade trees of that city for several years past. They are described by a gentleman who watched their operations with great interest, as 'stealing up to a louse, coolly seizing and tucking it under the arm, then inserting the beak and sucking it dry.' They are supposed to feed also on other vegetable-eating insects as well as the plant louse."

Phytocoris lineolaris swarms in our gardens during this month. It is described and figured in "Harris's Treatise on Insects." Closely allied, though generally wingless, is that enemy of our peace, the bed-bug. It has a small, somewhat triangular head, orbicular thorax, and large, round, flattened abdomen. It is generally wingless, having only two small wing-pads instead. The eggs are oval, white; the young escape by pushing off a lid at one end of the shell. They are white, transparent, differing from the perfect insect in having a broad triangular head, and short, thick antennæ. Indeed this is the general form of lice (*Pediculus vestimemti*, and *P. capitis*), to which the larva of *Cimex* has the closest affinity. Some *Cimices* are parasites, infesting pigeons, swallows, etc., in this way also showing their near relation to lice. Besides the *Reduvius*, the cockroach is the natural enemy of the bed-bug, and destroys large numbers. Houses have been cleared of bugs after being thoroughly fumigated with brimestone.

During this month the ravages of grasshoppers are in the West, very widespread. We have received from Major F. Hawn, of Leavenworth, Kansas, a most interesting account of the Red-legged locust (*Caloptenus femur-rubrum*). They commence depositing their eggs in the latter part of August. They are fusiform, slightly gibbous, and of a buff-color. Tney are placed about three-fourths of an inch beneath the surface, in a compact mass around a verfical axis, pointing obliquely up and outwards, and are partially cemented together, the whole presenting a cylindrical structure, not unlike a small cartridge. They commence hatching in March, but it requires a range of temperature above 60° F. to bring them to maturity, and under such conditions they become fledged in thirty-three days, and in from three to five days after they enter upon their migratory flight.

"Their instincts are very strong. When food becomes scarce at one point, a portion of them migrate to new localities, and this movement takes place simultaneously over large areas. In their progress they stop at no obstacle they can surmount. In these excursions they often meet with other trains, from an opposite direction, when both join in one.

"The insects are voracious, but discriminating in their choice of food, yet I know of no plant they reject if pressed by hunger; not even the foliage of shrubs and trees, including pine and cedar."

We find the Hop-vine moth and the larva which abound on hops the last of summer. Also the *Ilythia colonelia*, known in England to be a parasite of the Humble bee. We have frequently met with it here, though not in Humble bees' nests. The larvæ feed directly upon the young bees, according to Curtis (Farm Insects). The Spindle-worm moth (*Gortyna*

zeæ), whose caterpillar lives in the stalks of Indian corn, and also in dahlias, flies this month. The withering of the leaves when the corn is young shows the presence of this pest. The beetles of various cylindrical Bark borers and Blight beetles (*Tomicus* and *Scoltuys*) appear again this month. During this month the Tree cricket (*Œcanthus nivens*) lays its eggs in the branches of peach trees. It will also eat tobacco leaves.

We have the moth of *Ennomos subsignaria*; the larva of which is so injurious to shade trees in New York City. It is a widely diffused species, occurring probably throughout the Northern States. We have taken the moth in Northern Maine. We have received from Mr. W. V. Andrews the supposed larvæ of this moth. They are "loopers," that is, they walk with a looping gait, as if measuring off the ground they walk over, whence the name "Geometers," more usually applied to them. They are rather stout, brown and roughened like a twig of the tree they inhabit, with an unusually large rust-red head, and red prop-legs, while the tip of the body is also red. They are a little over an inch long.—*Packard's Insect Calendar 1873.*

The Florida Land Tortoise-Gopher.

Gopherus Polyphemus.

It seems very strange that so little has been known, or at least has been published about the habits of this very common animal. Winter visitors to Florida and the Gulf States often observe their burrows on the sandy ridges, each with its yawning entrance and scattered mound of subsoil, and are not unlikely to mistake them for the woodchuck holes with which they are familiar at the north. It is the permanent resident, however, that is most likely to have some acquaintance with the animal itself; for only in the hottest weather and at noonday does the gopher leave its burrow to feed upon the surrouding grass and herbage.

In summer, when the thermometer is in the nineties, the animal comes forth daily, sometime between the hours of eleven a. m. and two p. m., and takes a careful look around to assure itself that no danger threatens. Then, if no ominous sounds disturb the stillness of the sultry air, it raises itself high on its ungainly legs and starts briskly off for the nearest patch of grass or cultivated field.

For about an hour the gopher wanders about with its long neck outstretched and plucks ravenously at every green vegetable within its reach. Often, indeed, in its eagerness it cracks up and swallows dead twigs and dry leaves together with the more succulent food, until its ravenous appetite is appeased. It then retires to the bottom of its burrow in the moist, cool sand, there to remain until the morrow or, if the season be rainy, until the next dry, hot day.

The gopher is a very timid and alert animal, and although it feeds with great gusto and apparent abandon, it is seldom so absorbed in its work that it fails to hear the sound of approaching footsteps. The near approach of any large animal sends it scurrying back to its hole. It requires lively work to head off its retreat, but if surprised and captured at a distance from its hole, like other turtles, it retires into its shell, and, drawing its plethoric and scaly fore paws like double doors over the front of its shell, it resigns itself supinely to its fate, and never under any circumstances attempts to bite or otherwise defend itself.

In winter the gopher very rarely quits its burrow, and comes forth to feed only on the very hottest days at noon. In the warm Florida soil it is never torpid, but remains quiescent at the end of its gallery awaiting the return of dog-day weather.

A well grown gopher measures 10 inches in length by 7½ inches in width and 4½ inches in thickness, and weighs about 6 pounds. Individuals are sometimes found measuring 12x9½x5 inches, and weighing 9 or 10 pounds.

They are sold in the markets of many towns at high prices, and are eaten by the negroes and lower classes everywhere in the south. The flesh is excellent in quality, very tender, of a rich red color and has the appearance, flavor and odor of beef. But the supply of meat obtainable even from individuals of the largest size is scanty, the greater part of the body cavity being occupied by the enormous gut crammed with grass and the long intestines filled with wads of fibrous dung. The flesh is greatly relished by all carnivorous animals, but a gopher of average size has little to fear from their attacks. The largest dogs are unable to bring their canine teeth to bear upon any vulnerable part unless the specimen is young and small enough to be taken into their mouths.

In May or June the female deposits in the sand outside of her burrow from one dozen to twenty eggs. The eggs are perfectly spherical, pure white in color and have a diameter of 1⅝ inches. More beautiful objects can hardly be found to grace an oological cabinet.

The burrows of the gopher are excavated by the aid of a remarkable spade-shaped projection on the front of the under shell, assisted by the powerful fossorial front legs, which are armed for this purpose with strong blunt claws.

In the sandy uplands of Florida the galleries descend at an angle of about 35°, and reach a vertical depth of seven to nine feet from the surface of the ground. They follow a straight course unless deflected by a root or some other obstruction and usually terminates in a layer of indurated soil. The length of the gallery varies from twelve to eighteen feet. The temperature at the lower end does not vary greatly throughout the year, and will generally not fall below 74° in winter nor rise above 79° in summer. The conditions as to moisture are probably equally constant. At Crescent City, Fla., where these observations were made, the permanent water table lies at an average depth of eighteen feet. The burrow of a gopher once completed becomes its permanent residence, and it is with extreme difficulty that the animal can be compelled to vacate and excavate a new home.

It is inhabited by the same individual for a long period of time, and if popular belief in the great age attained by turtles in general and the land tortoise in particular is well founded, some of these reptilian domiciles may have antedated the present century, and even rival in antiquity the dwellings of man. Certain burrows in this vicinity are pointed out as having been in existence twenty-four years ago, when the oldest orange groves were planted. This necessarily implies a continuous occupancy by the same individual tortoise during that period, since if the galleries are abandoned they shortly become filled up and oblerated in our shifting sand.

Every naturalist will appreciate under the above showing what unusually favorable conditions here exist for the preservation of animal

life, and will not be surprised to learn that these little sand caves, with their equable climate, permanent and abundant moisture, perpetually and hospitably open to the outer air, afford an asylum and a domicle to a most interesting assemblage of animals. The list of these, when it shall have been completed, bids fair to become a long one.

Not only the Florida burrowing owl, rattlesnake, the rabbit, the raccoon and the opossum find in them a temporary shelter, but another vertebrate also, a frog, here takes up its permanent abode and lives on terms of perfect friendship with the gopher. This frog is the sub-species *Rana arcolata æsopus*, a beautiful form, with soft subterranean coloration and crepuscular, toad-like habits.*

It is not rare, nearly every gopher hole harbors one or several specimens. They may be seen at evening sitting just outside the entrance of the burrow, and frequently in the morning or on cloudy days their soft radiant eyes may be detected gleaming out of the shadows a few feet back from the entrance. It is not easy to capture them, except with a baited hook and line, for at the slightest alarm they leap quickly down the yawning throat of the gallery and disappear from view. Specimens of this frog have been seen which would weigh more than a pound, and individuals of colossal proportions are reported to exist.

In January and during July of the present year more than a dozen species of articulates have been discovered living in the gopher holes. The majority are undescribed and new to science.

Two only are parasitic upon upon the gopher: (1) a large tick, which fastens itself upon the skin of the animal or to the sutures of the shell; (2) a gigantic acarus, a quarter of an inch in length, which does not remain upon the body of the gopher but attacks it within the nest, which, like the bed-bug, it never quits. Some of the burrows are infested with these blood-sucking mites and others appear to be entirely free from them.

The dung of the gopher furnishes food to five beetles and one interesting caterpillar of a moth. All of these are new and peculiar forms, presenting characters that indicate subterranean habits of life.

* Mr. Fred'k C. Test. of the National Museum, who kindly determined the species, writes: "Only one specimen, the type, is in the museum collection or presumably in any other." The type specimen came from Micanopy, Fla., probably without notes of habits, etc.

A large wingless cave cricket, apparently a *Phalangopsis* swarms in all the burrows.

Three predatory beetles, one of which, a new species of *Anthcus*, may prove to be a prowler from without, have been found within the galleries.

A very large specimen of the whip-tail scorpion (*Telephonus*) was found in one of the burrows. It was living in a short gallery of its own, which opened into the nest of the gopher at the lowest level. A minute *Pseudo-scorpion* is also found at the lower end of some of the burrows.

A flea of undetermined species, of which a single specimen was found in one of the holes, may prove to be an intruder, left behind possibly by some mammalian visitor.

The following is a review of the animal parasites and messmates of the gopher:

VERTEBRATE.

1. The gopher frog, *Rana arcolata æsopus.*

ARTICULATES.

1. *Copris*, new sp. Feeding on dung of gopher.
2. *Onthophagus*, sp. Feeding upon dung of gopher.
3. *Saprinus*, new sp. Feeding upon dung of gopher.
4. *Saprinus*, sp. Feeding upon dung of gopher.
5. *Aphodius*, new sp. Feeding upon dung of gopher.
6. *Staphylinide*, probably a Philonthus. Predatory.
7. *Trichopteryx*, sp. A species found also outside.
8. *Anthicus*, new sp. One specimen only.
9. Pyralid moth. Caterpillars feeding upon dung.
10. Cave cricket (undetermined).
11. Acaride parasite of the gopher (undetermined).
12. Gopher tick (undetermined)
13. Pseudo-scorpion (undetermined).
14. Whip-tail scorpion. Predatory intruder.
15. Flea, probably a mammalian parasite.

Most of the insects have been submitted to Mr. E. A. Schwarz, of the Department of Agriculture, Washington, D. C., and to him I am indebted for the determinations given above.—*Henry G. Hubbard, Detroit, Mich., in Science.*

New Museum for Philadelphia.

Plans have been prepared and accepted for the erection of the new museum in connection with the University of Pennsylvania for archaeological and kindred collections to be placed in the University grounds adjacent to the proposed Commercial and Economic Museum which the city of Philadelphia maintains now, occupying the Pennsylvania Railroad buildiug. The new museum will cost $1,500,000. This, in connection with the city plant and the Wister Institute which the University has already erected, will furnish a Museum for public use worth $4,000,000.—*N. Y. World.*

A Kansas botanist writes us as follows: "If you have space in your valuable paper I wish you would please give some hints how to preserve fungi, especially toadstools and mushrooms. How to preserve them for a collection or herbarium. I have tried all ways but I never succeed."

The Great Auk and Egg in the Academy o Natural Sciences of Philadelphia.

MOUNTED BIRD:—About twice the size of Razor-billed Auk, white breast, webbed feet; back, tail and neck black; neck white from breast, meeting the black neck half way up in a triangle; wings short and black; eyes black, with white spots, about size of a half dollar, and bean-shaped between the eye and bill on both sides; bill about four inches long, black with gray markings radiating downwards and forwards; bill three inches long, three inches thick and one-fourth of an inch broad, and tapering to a point. Bird was abundant on Atlantic coast, now entirely extinct; none seen since 1844.

EGG:—One of three in the U. S., the other two in the museum of Vassar college, Poughkeepsie, N. Y.; and at the Smithsonian Institution, Washington D. C. This egg is quite large and a handsome specimen, being twice the size of a Murre, and similar in markings to same. Ground color is of dark white or buff with irregular markings of brown streaks principally at the larger end. The egg is exceedingly rare being worth several thousand dollars I am told.

M. T. CLECKLEY, M. D.
Philadelphia.

PENIKESE—A Reminiscence.

By One of its Pupils.

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CHAPTER I.

THE JOURNEY.

Penikese is a name ever to be remembered by me with the greatest of pleasure,—for it was there I passed some of the happiest hours of my life. I remember it all: the ground, with its undulating billows sodded with the sparing green and brown of low grasses or covered with sandy loam; the waters, with their rusty and smutty rocks rearing their jagged edges above the quiet expanse of the bay, or dashed against by turbulent waves; and the boulders, with their whitened faces; lying confusedly as they had been cast upon the wave-beaten beaches or strewn, like ancient sentimels, here and there about the fields;—I picture them all as if it were but yesterday. Then the buildings—the laboratories, the lecture-rooms, and the professors' house—(the last the most conspicuous of them all), mean in themselves yet dear from their associations,—I think of each and I love each. Ah! Shall I ever experience such free, such happy, such truly joyous hours again? But let me tell you how I happened going to Penikese Island, and what I saw, heard, and did there.

I had been sitting, one fine morning in early spring, by a cosy grate fire, perusing the columns of my favorite morning paper, when my eyes fell upon a short paragraph which instantly arrested my attention. It was the notice of a "Summer School of Natural History," and read as follows:—

"Mr. John Anderson, of New York, has presented to a body of Trustees, the island called Penikese, in Buzzard's Bay, for the site for a Summer School of Natural History, to be in the charge of Professor Louis Agassiz, whose purpose is to give free instruction, to teachers of the science, in correct methods of study in this most important branch of education."

The subject was one of peculiar interest to me, and, as I read, visions of what a grand opportunity would thus be afforded to study Nature so filled my mind, that they took complete possession of my senses.

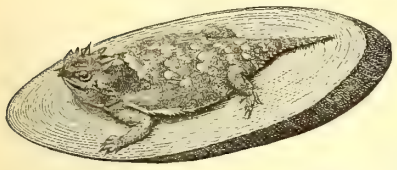
Natural History was always and is now for that matter, my favorite study; one might almost say I had been born and bred a Naturalist. From my earliest recollection I was often made supremely happy by the present of a robin's or a sparrow's egg, or some other similarly common natural object, from the bounteous collection of a friend. *To me*, it was untold gold. If an egg, I would hold the delicate shell in my fingers, slowly and carefully turn it from side to side, examine its glossy surface and perfect proportions, look at the holes in its extremities to see how thick the shell itself might be, and often—though I hardly dare to tell it for fear of being laughed at—wonder how much wind had been required to expel its contents. From my first egg I soon reached my hundredth—and more. Then I formed the plan of making a general collection in all of the different branches of Natural History which, carried into effect, was successful beyond my most sanguine expectation. Thus, at an early period of my life, in the full glow of scientific ardor, a short and almost insignificant newspaper paragraph—insignificant, perhaps, to all save a few—appeared at once to open to me a possible path to scientific fame and attainment that in my youthful ambition seemed limitless. The opportunity and the Master, the best that the country, nay the world, then afforded! I immediately applied for admission, and received, by return of mail, an answer from Professor Agassiz himself—in his own hand-writing and with his own autograph attached—accepting me as his pupil and inclosing full instructions. Thenceforward I could eat, drink, think, and dream of nothing save Penikese. Oh, how I longed for the time to come when I might journey thither.

At length the day for my departure arrived. How eagerly and with what a glad heart I packed my trunk and valise and started tor the nearest railroad station. My friends must certainly have thought me hard-hearted as I left them, shouting my good-byes from the top of the coach to which I had sprung, with as much apparent joy as if a rich Uncle had just died and bequeathed me a fortune, and I was forthwith going into the possession of it.

I was soon on board the train and travelling toward my destination. How slowly we appeared to move. It seemed as if I might easily have outdistanced this or any other train, today, on foot,—and yet we must have been going at fairly rapid speed. Having composed myself as best I could, I found amusement for a time, in watching from the window, as they passed in quick succession, the fields, covered with curling stalks of young grain or downy with soft heads of timothy and other grasses; the new-mown hay lying in loosely scattered heaps or gracefully-curled swaths upon its bristling stubble; or, here and there, a solitary person still working at his daily toil. Close by, in a nearer portion of one of the meadows, a tall, lank individual was standing on an immense load of hay, upon which he was stowing away fork-full after fork-full as it was pitched to him by an equally tall, lank individual, who was standing on the ground below; while a fine pair of blacks stood, in lamb-like attitude, just in front of the load. Another moment, and, frightened by the noise of the train, the blacks were scouring the fields, like a pair of wild prairie mustangs, bearing with them the fast-decreasing pile,—while one of the tall, lank individuals was assisting the other to rise from the ground. Then we dashed by to where a number of coatless workers were raking the hay, with the utmost diligence, into small, rounded piles, that it might the more easily be pitched upon the cart which should arrive for it. Past these we went, to a large swamp dotted here and there with hummocks where grasses, huge, rough brakes, and delicate ferns grew in luxuriance and abundance; and upon some of them, nearest the track, I could even distinguish wild flowers rearing aloft their slender stems and delicate heads, and tell the species of many of them. Then we came to a long, thickly-wooded stretch, where a forest of trees, large and small, extended far along the track on either side, arching their tops and intermingling their branches as if they would bind us with their mystic spell; but, like a prisoner who would not be bound, we dashed through and by them, only to emerge into the light of still more fields, and still new scenes. Weary with gazing at these, I then, tried to count the telegraph poles as they appeared to whiz by us, or watched the wires as they travelled, or appeared to travel, now up and now down my window, as the height of one pole above another or the inequalities of the road-bed showed themselves. Thus amusing myself, now with this scene now with that, we journeyed on, hour after hour, until, at length, the scene materially changed and salt water

[TO BE CONTINUED.]

HORNED TOAD,
Phrynosoma.



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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

Florida Coast Shells
at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

We therefore make you the following offer: From now until October first we will fill all small orders for Sea Shells at very little more than the actual cost of packing and postage.

We will fill any order from ten cents to $2, and give you a finer and larger collection for the money than you ever had before.

We have large quantities of Florida coast and river shells, and we take this method of reducing our stock before the autumn collecting begins.

Unless otherwise ordered we will send a general assortment, and each purchaser, whether large or small, will receive some fine and rare shells.

Send registered letter, currency or stamps.

Address,

The Ebersold Family,
Oceanus, Brevard Co., Fla.

For a short time only, we will sell *Buffalo Horns* nicely polished and mounted at from $1.50 to $3.00 per pair Address, GILLBERT BROS. & GRIFFEN, Taxidermists, 1519 Leavenworth St., Omaha, Neb. 24-13t.

YOU CAN GET YOUR **PRINTING**

a little **CHEAPER** or a little **BETTER** by sending to **A. M. EDDY, ALBION, N.Y.** A specialty of natural history printing, catalogues, books, magazines &c. ☞100 envelopes, 100 letter heads and 100 cards, all for 100 cents. Send for samples of our printed stationery. 9

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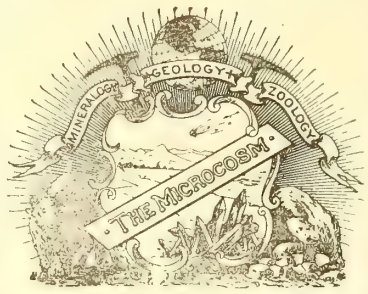

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LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals

t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

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RARE SPECIES of North American Bird Skins a speciality, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Secure some of these *rare ones* while you have the chance. I will mention a few only: Franklin's and Richardson's Grouse, Ashy and Fork-tailed Petrels, Xantus, Marbled and Ancient Murrelets, FaralloneCormorants, Pacific Fulmars, Black-vented Shearwaters, Least, Crested and Parrot Auks, Aleutian and Prybilof Sandpipers, Rio Grande Turkeys, Aplomado Falcons, Arctic Horned Owls, Copper-tailed Trogons, Ivory-billed Woodpeckers, Carolina Paroquets, Great Black Swift, St. Lucas, Coues' and Sulphur-bellied, Flycatchers, Swainson's, Bachman's, Red-faced, Graces, Hermit, Golden-cheeked, Lucy's, Virginia's, Olive and Brasher's Warblers, Mirador Yellowthroat, Townsend's Juncos, White-naped Nuthatch, Anabel's Bluebirds, and thousands of others. Also many beautiful Tropical species. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country.

CHAS. K. WORTHEN,

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Warsaw, Ill., U. S. A.

Established in 1873.

CRYSTALS.

If your cabinet is not represented by a suit of those superbly crystalized North Carolina Quartzes, it is lacking in one of its most beautiful and attractive features.

Quartzes in Crystals, with the following inclusions: Large, movable water drops, as large as peas; **Kaolin; Clay,** different colors; **Wad; Chlorite; Micas; &c.**

Rutilated Quartz in all varieties, clear and amethyst. This is a true gem stone, odd and beautiful.

Zircons in large, modified and small brilliant Crystals.

Occasionally, the following can be sent out in extra specimens: **Beryls, Columbite,** in piled groups of crystals; **Gem Amethyst; Rutile,** blood-red, single Crystals; **Hiddenite,** the best to be had but none very large; **Kyanite,** sky-blue Crystals; **Octahedrite; Chlorite Crystals; Samarskite; Gummite; Tourmalines,** fine black with terminations, also in groups of doubly terminated Crystals, rare; **Garnets,** Crystals and fine pieces for cutting, peculiar tint; **Monazite,** and others.

I wish to call attention to some magnificent Crystals and groups of Quartzes, suitable for Museums and College collections, one group on hand weighing 40 pounds.

Write for estimates on what you wish or collections showing the entire Quartz range of the State.

Collections of any size sent on approval. Address.

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	Per Egg.
King Rail, 1-7, 1-11, 1-12	$ .10
Green Heron, 1-3, 1-4	.06
American Woodcock, 1-3 (not quite first-class)	.50
Acadian Flycatcher, n-3	.10
Blue Grosbeak, n-4	.15
Indigo Bunting, 1-3	.06
Cardinal, 1-3	.05
Bachmans Sparrow, 2-4 (not first-class)	.25
Pine Warbler, n-3, n-4	.25
Yellow-breasted Chat, 1-3, 1-4	.05
Maryland Yellowthroat, 1-2	.08

All first class, except where noted, with full data.

Birds Skins, Mammal Skins, Reptiles, and Batrachians.

H. H. & C. S. BRIMLEY,

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Large Resurrection Plants,

By mail, 10c. Small, 5c. G. W. TUTTLE,
19tf-o Pasadena, Calif.

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NATURAL SCIENCE NEWS

VOL. I. No. 28. ALBION, N. Y., AUGUST 10, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All **copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.**

EXCHANGE.—Collection of Mexican postage stamps. 200 in album, fine condition, value $10. What am I offered in eggs, singles. ROBT. D. WAINWRIGHT, 47 Canal St., Stapleton, S. I., New York.

FOR EXCHANGE.—First class butterflies from this vicinity, mounted or in papers, for the same from the South and West. EVERETT E. JOHNSON, 7 Bartlett St,, Lewiston, Maine.

FOR SALE.—Strictly first class '95 bicycle for best cash offer over $60. Those meaning business write for description. ROY CRIBFIELD, Atlanta, Ill. O.

MOUNTED Fiddlers, for only 10c. Think of it! Or will exchange one for every 25c worth of eggs, skins, curios or Nat. Hist. specimens. No fossils or minerals wanted. No stamps taken. Order quick! R. G. PAINE, 57 Charlotte St., Charleston, S. C.

CARPET Cleaning Recipe. Cleans carpets as good as new without having to take them up. Don't ruin the colors and is free from acids. 50c cash or $1.00 in exchange. Big profits, particulars for stamp. C. N. STURTZ, Adamsville, Musk Co., O.

TO EXCHANGE.—A new Steven's "Favorite" rifle, 22 cal. for a scroll saw and lathe or offers. THOS. C. HORNE, Dover St, Milwaukee, Wis.

WANTED.—1st class skins with full data and A 1 Lepidoptera in papers. Have fine sets and singles, and Lepidoptera. Complete data. Send lists. C. HOUGHTON, L. Box 297, Potsdam, N. Y.

TO EXCHANGE.—Canvas canoe, 36in. beam, 9 feet long, carries two men, for small tent and $3 00 or all cash. Particulars for stamp. ALBERT B. FARNHAM, Benning, D. C.

WANTED —Shot gun. Will give in exchange a double roller printing press, three fonts of type, walnut coin cabinet fifteen drawers, handsomely made, cost $20. ROBT. D. WAINWRIGHT, 47 Canal St., Stapleton, S. I., N. Y.

WANTED.—Indian Pottery and Relics in exchange for good entomological collection. and a few good birds eggs also several copies of the "Annual Report of the Bureau of Entomology" and the "United States Geological Survey." Talk business JOHN TRACY, Agricultural College, Ingham Co., Mich.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

T PERCHES FOR SALE.—I have on hand 15,000 small T perches 3 inch base. I wish to dispose of these at once and in order to do so have put the price clear down to hard pan. Oak finished 5 cents each; pine, painted white, 4 cents each; pine, not painted, 3 cents each. All sizes will be turned to order. Sample sent prepaid for 10 cents in stamps. E. L. HALEY, Phillips, Me.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds.," EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

BICYCLE for sale or exchange:—A Crescent wheel, cost $100, as good as new except the cushions. Have had the wheel some time but as there are no good roads here have used it very little. I will take $50 cash for it or exchange for Baltimore or Columbian hand press and first-class Roman type. Address D. S. EBERSOLD, Oceanus, Brevard Co., Fla. 26-4t

SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

I have recently found some white **Chalcedony Geodes** in the Bad Lands, South Dakota that are different and more elegant than any I ever saw from any part of the world. They are rarities, in size from a hen's egg to a goose egg and lined with brilliant sparkling, frost-like white crystals; a few amethystine tinted and a few with transparent selenite, and others like snow. I will send them postpaid for 25, 35 and 50 cents. Small ones unopened 10 and 15 cents.

You never had any Geodes in your collection as handsome.

Minerals from all parts of the world, especially the Black Hills and the west.

Cheyenne River **Fossils.**

Indian Buckskin Relics and **Weapons** from many nations.

Shells, Indian Photos of a hundred leading chiefs.

Send stamp for priced catalogue.

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L. W. STILWELL,

Deadwood, S. D.

For a short time only, we will sell *Buffalo Horns* nicely polished and mounted at from $1.50 to $3.00 per pair. Address, GILLBERT BROS. & GRIFFEN, Taxidermists, 1519 Leavenworth St., Omaha, Neb. 24-13t.

YOU CAN GET YOUR PRINTING

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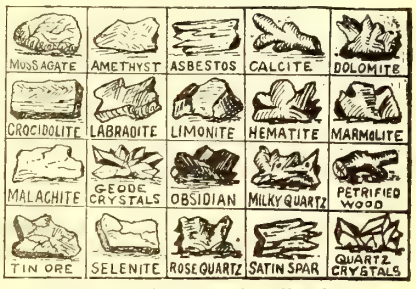
Birds Eggs and Skins

If you collect them, to have first-class specimens, you *must have first-class Tools.* We have that kind, and prices the lowest. Send 2 cent stamp for our Illustrated Catalogue.

"Starter" Mineral Collection.

20 showy specimens (like cut, but larger).

35 cents postpaid.



"Our Pet" Mineral Collection.

52 Specimens all named, such as usually sell for 5 and 10 cents each, will send prepaid for

Only $1.00.

Mineral and Shell Catalogue for 2 cent stamp.

CHAS. K. REED,

Naturalist and Taxidermist,

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Naturalists' Supplies and Books.

Manufacturer of Oval Convex Glass Wall Shades (Patented).

A specialty made of fine work on Fish and Game Heads or Large work of all kinds.

Fur Rugs and Robes Tanned, Lined and Mounted.

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Large Premium Lists and Free Exchange Column.

ONLY 50 CENTS A YEAR.

Sample copy for stamp. Subscriptions can begin with any number. Articles on Taxidermy commence in March number. Address

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NEW YORK CENTRAL

& HUDSON RIVER R. R.

THE FOUR-TRACK TRUNK LINE.

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Stations.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....		8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00

Magnifying Glasses!

Insect Pins!

Botanical Collecting Cases and Presses!

Our sale in liquidation still continues at

GREATLY REDUCED PRICES.

Send for 16-page circular and circular 623.

QUEEN & CO., Inc.,

Makers of Acme Microscopes,

Philadelphia, Pa.

J. G. GRAY, Assignee.

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New Minerals.

I have recently secured a few new and unique examples in the Mineral line, and have placed them on sale at my Chautauqua stores. I find that of a few of the most desirable I have stock sufficient to give the readers of NATURAL SCIENCE NEWS an opportunity to enrich their collections at the following very reasonable prices. All prepaid at quotations given.

Meteorites.—Small perfect specimens from Canon Diablo, Arizona, would make nice mounts for scarf pins. Each 25c, six for $1.00. Larger specimens at 50c, $1 and $2 each.

Fluorite.—Delicate green specimens from St. Lawrence Co., N. Y., 5c to 50c.

Ferruginous Quartz.—Beautifully colored, doubly terminated crystals from Seven Rivers, New Mexico, 10c each; 7 for 50c.

Amethyst.—Doubly terminated crystals from Uruguay, 35 and 50c.

Itacolumite.—Selected specimens of this peculiar and interesting flexible sandstone from Georgia, 10c to $1.00.

Quartz Crystals.—A fresh supply of those clear, colorless, world-renowned crystals from Hot Springs, Arkansas, 10c to $1.00.

Opal.—Cut and polished specimens from Mexico, ordinary retail value 75c to $2.00 each, will sell as long as they last at 60c each; 2 for $1.00; 5 for $2.00

Opal.—Beautiful Massive green specimens from Douglas, Wash., (a new locality) 10c to $1.00.

Native Lodestone, from Magnet Cove, Ark., 10c to $1.00.

Tourmaline.—Brilliant black, doubly terminated crystals from Pierrepont, N. Y.. 10c to $1.00.

Rubellite.—Selected specimens of this delicate pink tourmaline in lilac lepidolite from San Diego Co., Calif., 10c to $1.00

"Electric Stone."—A peculiar variety of tremolite so highly charged with phosphorescence that it readily gives forth interesting lights when scratched with a harder substance, 10c to $1.00.

For any of the above, Address during August only to

FRANK H. LATTIN,

Chautauqua, N. Y.

PRINTING! Little better; little cheaper! Enclose a stamp and get our estimate. Address A. M. EDDY, ALBION, N. Y. 9

MINERALS and Indian Relics, List for 2c stamp. Isaac S. Kirk, Fremont, Pa.4yr

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DR. A. E. FOOTE,

1224-26-28 North Forty-first Street, PHILADELPHIA, PA., U. S. A.

Minerals, and Scientific Books.

The Largest and most complete stock in the world.

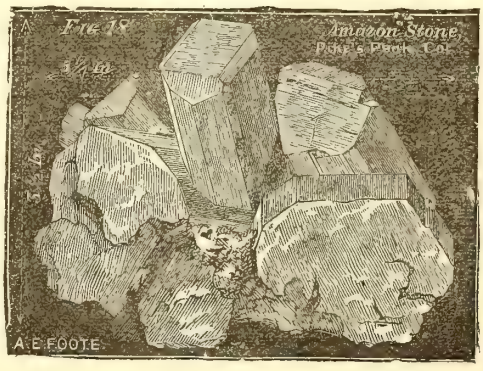
SYSTEMATIC COLLECTIONS, evenly covering the science of Mineralogy.

SPECIAL COLLECTIONS, illustrating the various ores, the uses of Minerals, their physical properties, &c., are furnished at lowest prices.

MINERALS FOR LABORATORY and experimental work.

RARE AND CHOICE Cabinet Specimens for Museums and advanced collectors.

ESPECIAL ATTENTION is given to the selection of material for students and investigators in crystallography, microscopy, &c., &c.



Recent Additions to Stock.

CALCITE. In splendid scalenohedrons from one to eighteen inches in diameter, containing *"phantoms" of Marcasite*, some of the larger crystals showing tints of amethystine and honey-yellow color divided by lines of bright Marcasite crystals. 25c to $10.00.

ICELAND SPAR. Where particularly clear or finely colored material was found, we sacrificed crystallization and obtained from parts of large crystals, what are believed to be the most beautiful rhombs of Iceland Spar ever seen. They show perfect transparency save for the exquisite coloring of yellow and various amethyst shades, and the bands of brilliant spear-shaped Marcasite crystals.

The small cleavages at 10c. to 25c. are of quite as fine quality as the cabinet specimens of higher price and make a novel addition to the collection of microscopist or amateur.

Send for our complete list of new arrivals.

Price Lists and Circulars Free.

(In ordering book catalogues, mention the subject in which you are interested.)

"Catalogue of Minerals,"

fully illustrated, 128 pages, 10c; bound, 20c.

DIASPORE CRYSTALS.—All of the resent find made at Chester, Mass., was secured by us. Clear, violet-colored crystals of high lustre and perfect crystallization are implanted on the emery, making specimens of a type new to collectors. None have been found but the few taken out some months ago and our collector informs us that there is little chance of their being found again; $2.00 to $15.00.

Small groups and microscopic specimens, 50c to $1.50.

ZEOLITES FROM OREGON. A new locality rivaling Nova Scotia in the excellence of its *Chabazites, Stilbites, Natrolites, Thompsonites.* A large lot received, containing many beautiful specimens, the groups of Chabazite being especially noteworthy. Also Lorandite, Kylindrite, Caswellite, Emeralds, Onyx, Sphalerite, etc., etc. Boxes of minerals sent for examination.

Always mention NATURAL SCIENCE NEWS *when answering this ad.*

Natural Science News.

VOL. I ALBION, N. Y., AUGUST 10, 1895. No. 28

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

TERMS OF SUBSCRIPTION.

PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN,
Albion, Orleans Co., N. Y,

Entered at Albion P. O. as 2nd class mail matter

The Cicada.

During this month (August) the Seventeen-year locust (*Cicada septendecim*) of Linnæus, has disappeared, and only a few Harvest flies, as the two other species we have are called, raise their shrill cry during the dog-days. But as certain years are marked by the appearance of vast swarms in the Middle States, we cannot do better than to give a brief summary of its history, which we condense in part from Dr. Harris's work.

The Seventeen-year locust ranges from South-eastern and Western Massachusetts to Louisiana. Of its distribution west of the Mississippi Valley, we have no accurate knowledge. In Southern Massachusetts, they appear in oak forests about the middle of June. After pairing, the female, by means of her powerful ovipositor, bores a hole obliquely to the pith, and lays therein from ten to twenty slender white eggs, which are arranged in pairs, somewhat like the grains on an ear of wheat, and implanted in the limb. She thus oviposits several times in a twig, and passes from one to another, until she has laid four or five hundred eggs. After this she soon dies. The eggs hatch in about two weeks, though some observers state that they do not hatch for from forty to over fifty days after being laid. The active grubs are provided with three pairs of legs. After leaving the egg they fall to the ground, burrow into it; and seek the roots of plants whose juices they suck by means of their long beaks. They sometimes attack the roots of fruit trees, such as the pear and apple. They live nearly seventeen years in the larva state, and then in the spring change to the pupa, which chiefly differs from the larva by having rudimentary wings. The damage done by the larvæ and pupæ, then, consists in their sucking the sap from the roots of forest, and occasionally fruit trees.

Regarding its appearance, Mr. L. B. Case writes us (June 15) from Richmond, Indiana: "Just now we are having a tremendous quantity of locusts in our forests and adjoining fields, and people are greatly alarmed about them; some say they are Egyptian locusts, etc. This morning they made a noise, in the woods, about half a mile east of us, very much like the continuous sound of frogs in the early spring, or just before a storm at evening. It lasted from early in the morning until evening." Mr. V. T. Chambers writes us that it is abounding in the vicinity of Covington, Kentucky, "in common with a large portion of the Western country." He points out some variations in color from those described by Dr. Fitch, from New York, and states that those occurring in Kentucky are smaller than those of which the measurements are given by Dr. Fitch. and states that these differences indicate that the groups, appearing in different parts of the country at intervals of seventeem years, are of different varieties." A careful comparison of large numbers collected from different broods, in different localities and different years, would alone give the facts to decide this interesting point. Mr. Riley has shown that in the Southern States a variety appears every thirteen years.

Regarding the question raised by Mr. Chambers, whether the sting of this insect is poisonous, and which he is inclined to believe to be in part true, we might say that naturalists generally believe it to be harmless. No *Hemiptera* are known to be poisonous, that is, to have a poison-gland connected with the sting, like that of the bee, and careful dissections by the eminent French naturalist, Lacaze-Duthiers, of three European species of *Cicada*, have not revealed any poison apparatus at the base of the sting. Another proof that it does not pour poison into the wound made by the ovipositor is, that the twig thus pierced and wounded does not swell, as in the case of plants wounded by Gall flies, which, perhaps, secrete an irritating poison, giving rise to tumors of various shapes. Many insects sting without poisoning the wound; the bite of the mosquito, black fly, flea, the bed-bug and other hemipterous insects, are simply punctured wounds, the saliva introduced being slightly irritant, and to a perfectly healthy constitution they are not poisonous, though they may grievously afflict some persons, causing the adjacent parts to swell, and in some weak constitutions induce severe sickness. Regarding this point, Mr. Chambers writes:

"I have heard—not through the papers—within a few days past of a child, within some twenty miles of this place, dying from the sting of a *Cicada*, but have not had an opportunity to inquire into the truth of the story, but the following you may rely on. A negro woman in the employment of A. V. Winston, Esq., at Burlington, Boone County, Ky., fifteen miles distant from here, went barefooted into his garden a few days since, and while there was stung or bitten in the foot by a *Cicada*. The foot immediately swelled to huge proportions, but by various applications the inflammation was allayed, and the woman recovered. Mr. Winston, who relates this, stands as high for intelligence and veracity as any one in this vicinity. I thought, on first hearing the story, that probably the sting was by some other insect, but Mr. Winston says that he saw the *Cicada*. But perhaps this proves that the sting is *not* fatal; that depends on the subject. Some persons suffer terribly from the bite of a mosquito, while others scarcely feel them. The cuticle of a negro's foot is nearly impenetrable, and perhaps the sting would have been more dangerous in a more tender part."

It is not improbable that the sting was made by a wasp (*Stizus*) which preys on the *Cicada*. Dr. Le Baron and Mr. Riley believe the wound to be made by the beak,

which is the more probable solution of the problem.

A word more about the Seventeen-year *Cicada*. Professor Orton writes us from Yellow Springs, Ohio, that this insect has done great damage to the apple, peach and quince trees and is shortening the fruit crop very materially. By boring into twigs bearing fruit, the branches break and the fruit goes with them. "Many orchards have lost full two years growth. Though the plum and cherry trees seemed exempt, they attacked the grape, blackberry, raspberry, elm (white and slippery), maple, white ash, willow, catalpa, honey-locust and wild rose. We have traces of the *Cicada* this year from Columbus, Ohio, to St. Louis. Washington and Philadelphia have also had a visitation."—*Packard's Insect Calendar (1873)*.

Costa Rica at the Exposition.

The visitor in the Anthropological Building experienced a real delight and relief in coming upon the exhibit from Costa Rica. The displays in its neighborhood (from Mexico, Brazil and Paraguay) contained much of interest, but were inartistic and lacking in unity. The Costa Rica was in some ways a model.

The pavilion itself is quaint and attractive. A space of perhaps fifty feet by thirty is enclosed by a rather high board wall. Two doorways, facing each other, are in the middle of the longer sides. These doorways reproduce ancient flat-topped stone arches, decorated at their top corners with coarsely carved heads and squat figures. Large oil paintings hang on the external walls, one on each side of each doorway. They are set in wide gilded frames which are decorated with fret patterns copied from the stone ruins of Central America at the sides, while the upper border consists of enlargements copied from the grotesque bird and other figurines of gold which are found in the ancient graves. The pictures represent: (a) an Indian hut from Talamanca, (b) a view on the Uren River, (c) a chief's summer hut, in the Suerre Valley, dating back to 1544, (d) an Indian hut in San Bernardo, Sipurio, Uren Valley.

Entering the pavilion the visitor finds at the middle of the narrower sides gilded medalions, one of Vasquez de Coronado, the other of Isbel la Catolica. Each is the centre of a trophy composed of spears, bows, drums, nettings and fabrics of the modern Indians of Costa Rica. Upright frames, copper bronzed, wtth ornamentation derived from the old figurines contain full length and about life-size paintings of (a) a Talamanca Indian, with necklace of teeth, red ribbon hair-band, staff and breech-clout; (b) a Talamanca Indian woman with a little boy standing by her; the child is naked, while the woman wears a narrow red ribbon in her hair, a necklace of narrow strands, and a skirt cloth about her waist; (c) Indian of Guatuso, seated on a stone with hands on knees and wearing a breech-clout; (d) an Indian woman of Guatuso with waist cloth and cap. On the broader walls are also pictures, in horizontal frames, green bronzed and with ornamental patterns of frets and figurines. These pictures are in pairs, are on each side of each doorway and represent old Guetar graves, walled up with either rough rounded stones or narrow slabs. The details of construction are shown and the methods of archæological exploration. All of these oil paintings are by one artist—S. Llorente. The pavilion containing four handsome upright cases of oak, with plate glass doors, constructed for display on all sides, and with a crimson or maroon background. In these and in flat cases about the sides of the pavilion is a choice series of archæological specimens. Objects too large for the cases are arranged on individual supports in various parts of the room.

The ancient art of Costa Rica is very near, if not identical, to that of Chiriqui, so well described by Mr. Holmes. In the series here shown there are many *metates* or stones on which corn is ground. Some of these appear to be quite recent and are no doubt used by the present Indians. They are made from a grayish, porous, volcanic rock, and usually present a rounded cornered, slightly basined, squarish upper surface, on which the grinding is done, supported by queer animal, carvings. Stools of similiar material are numerous. These present fairly flat wind tops, supported by a carved openwork base, in geometrical patterns or representing animals; sometimes a band about the upper edge is carved with a line of faces or grotesque heads. Very common are human heads, carved in the volcanic material, displaying considerable variety in feature, and some with tattooed patterns on the cheeks, or with headdresses. Less common, apparently, are the heads of mammalia, some of them admirably done. Full length human figures, about a foot in length, representing both sexes, the sexual organs being, at times, strongly marked, are not uncommon. These are commonly in the same position, the hands stiffiy clasped upon the waist, the arms to the elbows closely against the sides. Yet more numerous are the quaint little figures, some six to ten inches high, squatting, with knees drawn up in front and the elbows resting on these. In some cases both hands are held to the chin or mouth; in others one hand is at the mouth and the other is on the knee. In almost, if not quite, all of these the head is exaggeratedly long and frequently bears a headdress or curious hair arrangement. Many hold a somewhat long cylindrical or barrel-shaped object to the mouth, with one or both hands. This object resembles somewhat an ear of corn, but the Costa Rica archæologists, I believe, consider it a cigar. In the flat cases is a large series of celts, or polished stone blades, mostly of the usual Antillean or Central American type. Many more special forms of stone objects might be mentioned, but we must pass to the fine series of pottery.

Here there are vases and jars of many forms in colors, commonly red or brown. Some are painted, others decorated with grotesque animal or human devices in relief; others quite plain. Many of the jars are tripod supported, and the legs are frequently hollow and with a little rattling ball of clay inside. Terra cotta whistles are plentiful—some simple, some in bird forms, some human figurines. Among these last are a few elaborate female figures, several inches high, with a considerable number of apertures to give a range of notes. Some plain ones are distinctly *ocarinas*. Rare, apparently, are the terra cotta rattles, copied after gourd rattles, and body and handle made in one piece. Very numerous are the little, flat, round, spoon-shaped censers, with handles wonderfully varied in ornamentation. Scores of pottery rings, like napkin rings, contracted usually about a middle zone, are plain, incised or decorated with reliefs. In all the pottery,

and of course we have not mentioned all the variety, there is a similarity or identity with the Chiriqui work described by Mr. Holmes.

We find the same identity in the gold figurines, a fair series of which are displayed in too little wood frames. There are quaint and grotesque figures of birds, beasts, frogs and nondescripts. With these are the little bronze bells (something like sleigh bells) some thin, rather broad disks of gold, three of them with designs worked out upon them.

It must be plain to the readers that the little republic has done herself credit. The exhibit was at Madrid last year, and there an excellent catalog in Spanish was printed. The collection is displayed by the *Museo Nacional de Costa Rica.* Space does not permit tracing the history of this young institution, but we must say that the credit of the present exposition on its behalf is in large part due to three gentlemen: J. Arellano, M. M. de Peralta and A. Alfaro.—*Frederick Starr, University of Chicago in Science.*

Botany in Jamaica.

By James Ellis Humphreys.

We are apt to think, when speaking of American botany and botanists, only of those of the United States and Canada, assuming that our southern neighbors, both continental and insular, have not yet reached that stage of civilization that encourages the cultivation of the sciences. And so far as those regions are concerned which have felt the influence chiefly of Latin civilization, this is measurably true. But some of the neighboring islands have been under Anglo-Saxon rule for two centuries or more, and have felt different influences. Not, indeed, that their people, as a class, have been much affected by contact with their rules, but in the British islands the mother country has especially fostered botanical study from an early time, and British residents have carried with them the scientific impulse.

Jamaica has been a British colony for fully two hundred years, and it is now more than one hundred since its first botanic garden was established at Bath. At first privately supported, it afterward received spasmodic government support. But eventually the site was abandoned and a new location was chosen beside the Wag water and among the beautiful hills of the interior nineteen miles north of Kingston. From this time the support of the government was constant and effective, and the Castleton garden grew steadily in consequence, under competent directors sent out from England. It has now an especially notable collection of palms and orchid, besides its economic collection.

Meantime the Hope Gardens, near Gordon Town, and six miles from Kingston, begun for private pleasure when the island was in the full tide of its prosperity from the profits of the sugar and rum, have been taken up by the government and are destined to be the chief botanical centre of the island. This collection is newer than that at Castleton and therefore does not possess as many fine specimens and, in some other respects, does not equal it. But most of the propagating and active work of the department is now done at the Hope Gardens. As must inevitably be the case with most government establishments, the chief work of the Botanical department of Jamaica, as of other British colonies, is economic, the study of the useful plants of the colony, their propagation and products. Its work is at present ably directed by Mr. William Fawcett, F. L. S., formerly of the British Museum.

A third establishment in charge of the department is the experimental *Cinchona* plantation far up the Blue Mountains. Here, also, is the official residence of the Director, in an almost ideal location and climate. Indeed, it is said, to quite justify the enthusiasm of an admirer, who called it "the loveliest spot in the British empire."

This place, called Cinchona, can be reached only by a narrow bridle-path that runs twelve miles upward into the heart of the mountains from Gordon Town.

The department issues a periodical bulletin of the results of its work.

Ever since the time of Patrick Bowne and Sir Hans Sloane, the higher plants of the island have found devoted students. And among them must be specially mentioned Grisebach, whose "Flora of the British West Indies," London, 1863, remains the only handbook of the subject. But the Thallophytes of the region have received little attention and offer a very attractive field.

The wife of the present energetic governor of the island, Sir Henry Blake, some time since proposed the raising of a fund to establish a permanent marine biological laboratory as a memorial to Columbus, who landed on the island on his second voyage. The idea is an admirable one, but the project remains, so far as can be learned, *in statu quo.* A small and well-equipped laboratory at a suitable point on the island, open to the zoologists and botanists of the world, might be of the greatest service in affording means for the collection and preservation of the numberless tropical forms of life in which Jamaica and the surrounding waters abound, A party of zoologists from the John Hopkins University has this year, for the second time, established a temporary labratory at Port Henderson on Kingston harbor; but I understand that this choice of a location has been largely governed by the presence of suitable accommodations. It will be agreed that, in determining the site for a permanent laboratory, the abundance of available vegetable, as well as animal, life should be consulted. After a somewhat careful examination of the marine flora of the easterly part of the island, as far west as St. Ann's Bay, the writer can say that several of the ports on the north side are far more favorable, botanically, than Kingston harbor. And perhaps no region is, on the whole, more favorably situated or richer in its vegetation than the neighborhood of Port Antonio. This port has more frequent communication with the United States than even Kingston, from its extensive fruit trade. And the journey from Europe to Jamaica is less monotonous and less expensive, as well as quite as quick, *via* the United States, as by the Royal Mail from England.

Another factor of considerable importance lies in the much cooler and more healthful climate of the north side of the island, as compared with the south side.

In Jamaica, then, the botanist finds evidences of past and present activity in certain lines, and the sympathy and aid of fellow workers. It is much to be hoped that he may soon be able to find, also, the laboratory facilities, which will enable him to study to the best advantage the unsolved problems of tropical vegetation.

PENIKESE—A Reminiscence.

By One of its Pupils.

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a big metropolis loomed in the distance. Presently the train, after passing through a perfect labyrinthine maze of houses, streets, archways and narrow alleyways, stopped, and we found ourselves safely landed at the "Hub of the Universe"—Boston.

From Boston we left directly for New Bedford, where we arrived about seven o'clock that evening and immediately engaged rooms for the night. Here the hotel was alive with excitement. Carriages were constantly arriving with guests,—mostly students like ourselves, and bent upon the same erraud. Men, both old and young, were going to and fro in all directions; porters, carrying huge trunks upon their shoulders, were continually running against the passers-by, or stumbling about under their loads to the seeming peril of a bevy of small boys, who were in everybody's way; and waiters, with white aprons, nicely balancing upon the tips of their fingers large trays filled with dishes, were hurrying here and there in apparently endless confusion. The clerk's desk occupied, very nearly, the centre of the room or long hall in which we found ourselves upon entering the hotel,—hence, to the general confusion was added the bustle and crowd attendant upon the registering of our names, and bell-boys showing people to their rooms. Nor should we forget the numerous bootblacks, who acted their part in the scenes about us. To get my supper, and find my room, and hasten toward the land of dreams, was the work of a comparatively short time,—though it seemed hours to one who was so tired as myself; but it was at last accomplished.

The next morning I awoke very early, refreshed both in body and in mind with my night's rest. It was too soon, as yet, to arise; and so I lay and watched the dancing sunbeams which through the blinds of my half-closed windows, shone and played merry pranks upon the opposite walls of the room, while the trees outside, stirred by the light off-shore morning breeze, sent shadowy images of fantastic shape, moving, here and there, among them. One immense, dumb-bell-shaped sunbeam amused me greatly in its attempts to smash a fine vase upon the mantle near by. It would dash at it with unerring accuracy and terrific impetus, only to stop short, within a few inches of it, and return immediately to its former position, leaving the vase wholly untouched. Above this beamed another, now intensely bright now quite dim; and, farther on, two small, active little fellows played hide and seek behind each other, so that the two became one and the one two again each alternate moment. At length, tired o watching the bright, roguish sunbeams, and animated by a lusty-sounding gong, which seemed to be beaten directly in front of my door, and, consequently, for my express benefit, I sprang from the bed and quickly dressed for breakfast. After the morning's meal I hastened to place my baggage in the hands of the porter whose duty it was to take it on board the little steamer, which was so soon to convey us to our island home, and then started for a stroll about this quiet, quaint, old-fashioned city,—there being yet several hours to spare before our departure.

I will not attempt to describe New Bedford, as I was in it for so short a time; but I wandered along one or two of its principal avenues, admiring the noble dwellings with their rich, handsome lawns, which, like miniature parks, fronted the streets at the farther end of the town, and then, returning, entered one of the small, dirty by-streets that led to a neighboring wharf, to which I directed my steps. What a sight here met my gaze. Vessels of all kinds and sizes, from full-rigged ships to perfect swarms of boats and dories, lay about me in every direction. It seemed as if there were thousands of them, though doubtless barely as many hundreds. Two full-rigged men-of-war, which had just arrived from France, as I learned afterwards, anchored some distance in the bay beyond the rest, seemed like monstrous guardians of whaling vessels, steamers—large and small—brigs; barks and schooners of all sorts and kinds. Vessels, almost new, shone resplendent with recent coats of bright paint above the rest, but most were so old and worn that you could almost have believed them to be veritable "Noah's Arks," I could not but admire several beautiful pleasure yachts that lay at anchor in the bay. I could see them, rolling about from side to side, showing their smooth planks and well made forms, and bending their masts gracefully in the air or dipping their handsome prows far into the waters which surrounded them. How I enjoyed the scene. It seemed to have a fascination for me that was irresistible.

Then I turned my attention to the wharf itself, which, like most of the others I could see about me, was built far into the water. It was covered with heaps of boards, new and bright, old and dingy, some immense plank, others thin deal,—and one very old pile came tumbling down with a noise like thunder, as I accidentally stumbled over several pieces which extended far beyond the rest; with barrels, apparently of oil and tar, whose blue sides and red ends, thickly streaked with an abundance of the same material as that composing their contents, showed up on all sides; and with piles of old iron, ballast-stones and spars and masts of vessels; all of which, with many other things of a like nature, lay scattered everywhere around in endless confusion.

At the farther end of the wharf were a group of dirty, bare-footed little urchins, who were amusing themselves with all sorts of doings,—one could, at first sight, barely distinguish them from the brown, dirty logs or barrels amongst which they played, and whose hands and faces, as well as their clothes, seemed equally bedaubed and grimy. Some of them were playing at marbles, while others, mere lookers on, were lying about in the mud and dirt, like so many flounders off the pier head at low tide, watching the progress of the games. On a low, narrow stairway, leading to the water, sat several youthful fishers, who appeared in high glee over four or five poor little fishes, barely as many inches long, which they had succeeded in catching with the most primitive pole, hook and line imaginable, and only after long and patient waiting, doubtless, upon their part. On the very end corner of the pier, a most wretchedly dirty, ragged and diminutive urchin was amusing himself by throwing stones at the numberless small chips of wood which were tossing about upon the rippling waters beneath him, or occasionally "skipping" some particularly smooth, flat pebble, which he had selected from the loose earth scattered about the pier around him, to the great delight of a still smaller specimen of existence, who jumped about and clapped his hands, as he counted the skips, most gleefully. It was a characteristic scene for such a place, and I watched it all with idle interest whilst waiting for the whistle of the "Helen Augusta" to summon us on board.

[TO BE CONTINUED.]

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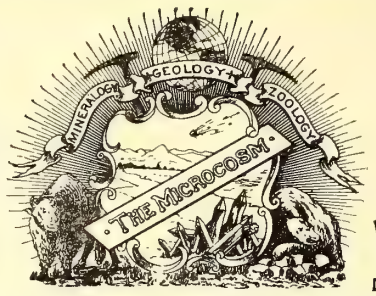

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NATURAL SCIENCE NEWS

VOL. I. No. 29. ALBION, N. Y., AUGUST 17, 1895. Weekly, $1.00 a Year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

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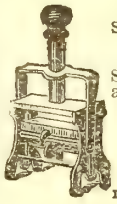

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Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
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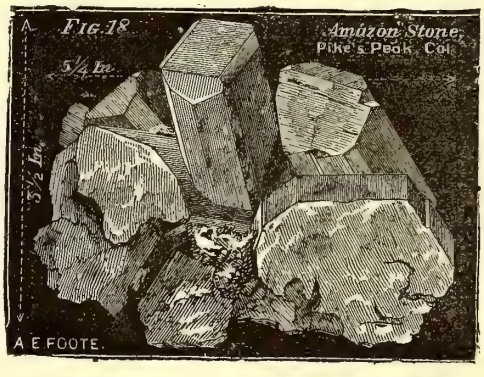

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Natural Science News.

VOL. I ALBION, N. Y., AUGUST 17, 1895. No. 29

Natural Science News.

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The Place of Museums in Education.

The most casual observer of educational methods could not fail to notice that the receptive mind of a child or a youth learns from an infinite variety of sources. We all know that we begin at one end of education, but there is no period in life of the most aged where the other end is reached. Frequently, again, that information which does not absolutely form part of the ordinary process of education, but which comes from unexpected quarters, is of as great service in the development of the mind as any set lessons can possibly be. Whatever becomes suggestive to the mind is of educational value. That Museums have from their very nature the very essence of this suggestiveness is patent. It may be true that of themselves alone they are powerless to educate, but they can be instrumental and useful in aiding the educated to excite a desire for knowledge in the ignorant. The working man or agriculturist who spends his holiday in a walk through any well-arranged Museum cannot fail to come away with a deeply-rooted and reverential sense of the extent of the knowledge possessed by his fellow men. It is not the objects themselves that he sees there, and wonders at, that cause this inspiration, so much as the order and evident science which he cannot but recognize in the manner in which they are grouped and arranged. He learns that there is a meaning and value in every object, however insignificant, and that there is a way of looking at things common and rare, distinct from the regarding them as useless, useful, or merely curious. These three last terms would be found to be the very common classification of all objects in aM useum by the uninformed and uninitiated.

After a holiday spent in a Museum the working man goes home and cons over what he has seen at his leisure, and very probably on the next summer holiday, or a Sunday afternoon's walk with his wife and little ones, he discovers that he has acquired a new interest in the common things he sees around him. He begins to discover that the stones, the flowers, the creatures of all kinds that throng around him, are not, after all, so very commonplace as he had previously thought them. He looks at them with a pleasure not before experienced, and talks of them to his children with sundry references to things like them which he saw in the Museum. He has gained a new sense, a craving for natural knowledge, and such a craving may, possibly, in course of time quench another and lower craving which may at one time have held him in bondage—that for intoxicants or vicious excitement of one description or another.

The craving for intoxicants or excitement is often as much a result as a cause. The toilers have few things to occupy their mind, and frequently in their home surroundings much cheerlessness and discomfort. Life is for very many a hard daily grind for mere existence, with little or no relief from the daily round of the struggle to make ends meet. These and other conditions under which so many live cannot fail to produce tastes and likings which are not qualified to tend to the uplifting of the mind and the desires by which their life is governed.

It it only those who come closely in contact with the more intelligent of the working classes, who know the nobility of character and the earnest reaching out towards higher things to be found among them, who can be familiar with the intense longing to have within their reach institutions such as Museums, Art Galleries and Free Libraries, to which they can have easy access. That such as these use the institutions which already exist is most amply and conclusively proved by the ocular demonstration of those who have visited the Museums in any of the large towns or the country.

The nation should never forget that some of its greatest benefactors have belonged to this class of intelligent working men. James Watt, the engineer, Hugh Miller, the stonemason geologist, Stephenson, the collier-railway projector, Arkwright, the weaver-inventor, and scores of others who could be named. Where, indeed, should we have stood as a nation had it not been for the sturdy common sense of the intelligent and thrifty working classes.

Until very recently the great defect of our system of education has been the neglect of educating the observing powers—a very distinct matter, be it noted, from scientific or industrial instruction. The confounding of the two is evident in many books which have from time to time been published. There are not a few who seem to imagine that the elements that should constitute a sound and manly education are antagonistic; that the cultivation of taste through purely literary studies and of reasoning through logic and mathematics, one or both, is opposed to the training in the equally important matter of observation through these sciences that are descriptive and experimental. There is considerable inconsistency in any such idea, and educational leaders are now universally recognizing the need there is for not giving too much attention to one class of mental training to the exclusion of the rest. Equal development and strengthening of all are necessary for the constitution of a well ordered mind.

A consensus of opinion is now apparent that this method is erroneous, and the Universities are now taking the lead by emphasizing to a less degree the merits of a purely classical education. The conductors of private schools, again, are beginning to see the great need which exists for a practical acquaintance with the leading Continental languages, and the Board school curriculum is rapidly becoming to mean a year or two de-

voted to technical instruction and manual training. It is almost impossible satisfactorily and effectually to conduct the latter without the aid of Museums, and these institutions are destined to occupy a most important place in this respect. Specimens of raw materials with labels clearly defining their properties and uses, and the relation that one kind of raw material bears to another kind, are now, in many instances, looked upon as indispensable scholastic aids.

The Manchester Exhibition was particularly useful in this respect, for there were many sections in which the various stages of the raw material up to the perfected article were shown, and it may safely be stated that no exhibition of modern times possessed in this way a wider and more real educational value than the very successful one held in Manchester in 1887. The silk, chemical pottery, and other sections were especially complete in this respect. The number of models of an almost infinite variety in these departments had a value attaching to them as a means of instruction, which could not fail to be useful to the many thousands of the youth of both sexes who visited the building at Old Trafford.

Vast collections of objects, whether in Museums or Exhibitions for educational purposes, do not always accomplish the object in view. Doubtless the vastness of the collections in some of our own Exhibitions in London and those which have been held in other cities, has been very impressive, but it may be gravely questioned whether any mind has carried away many useful impressions from the infinite multitude upon which he has had an opportunity of looking. The general mental state frequently produced by such a numerous display is that of distraction. There is such a state of mind as picture drunkenness or Museum drunkenness, and this should be carefully guarded against. There should be in Museums and Art Galleries a more extensive use of folding screens, so that anyone so disposed could themselves shut off from the crowd while they study a case or a picture minutely. A few striking objects well and carefully studied are infinitely better and of greater educational worth than a number of things at which there is only a casual glance.

Modelling, whether in cardboard, wood or clay, is an invaluable means of cultivating and developing the manipulative skill of youths. All know how readily a boy will take to the construction of a boat, or a girl to dress a doll, and in this lies the indiction that young people will take as readily to modelling as the boys do to cricket and the girls to their skipping ropes.

Charles Kingsley, addressing working men, with reference to their requirements. says: "We must acquire something of that industrious habit of mind which the study of Natural Science gives. The art of seeing, the art of knowing what you see, the art of comparing, of perceiving true likenesses and true differences, and so of classifying and arranging what you see, the art of connecting facts together in your own mind, in chains of cause and effect, and that accurately, patiently, calmly, without prejudice, vanity or temper."

The late Ralph Waldo Emerson, writing on the same snbject, says: "Manual labor is the study of the external world." This kind of manual labor should be taught in schools. Children's habits of collecting and arranging objects of interest should be encouraged. The study of a single branch of natural science, such as constructive botany, may be made the means of cultivating habits of neatness, order and skill. The analysis of plant-forms would illustrate the application of geometry to ornamental purposes, and open up wide fields for the development of decorative taste and manipulative skill. But cramped by the restrictive rules of our result system, these sources of useful culture are neglected; and, therefore, our children are turned out of the educational mill imperfectly prepared for the further processes necessary to qualify them for taking their part in the struggle for existence.

All this proves the necessity for Museums having the closest possible connection with elementary as well as advanced education. The uses of constructive botany, as referred to in the short quotation from Emerson, are especially helpful as a suggestive study to the mind. For this branch of education Museums are the best textbooks which can be provided, but in order that specimens in these branches of natural science be properly and usefully studied they require to be explained by competent teachers. It is in this respect that practical and efficient curators can be of the greatest service in giving short and informal explanations of some of the specimens in their Museums.

As far back as 1853, there was delivered at the Museum of Economical Geology, in London, a lecture by the late Professor Edward Forbes, on the Educational Uses of Museums. In one part of this lecture he spoke as follows: "In their educational aspect, considered apart from their educational applications, the value of Museums must in a great measure depend on the perfection of their arrangement, and the leading ideas regulating the classification of their contents. The educated youth, ought, in a well-arranged Museum, to be able to instruct himself in the studies of which its contents are illustrations, with facility and advantage. On the officers in charge of the institution there consequently falls a heavy responsibility. It is not sufficient that they should be well versed in the department of science, antiquities, or art committed to their charge. They may be prodigies of learning and yet utterly unfitted for their posts. They must be men mindful of the main end and purpose in view, and of the best way of communicating knowledge according to its kind, not merely to those who are already men of science, historians, or connoisseurs, but equally to those who, as yet ignorant, desire to learn, or in whom it is desirable that a thirst for learning should be incited." Among the most useful Museums are those which are made accessory to professional instruction, and there are many such in the country, but almost all confined to purposes of professional education, and not adapted or open to the general public. The Museums of our Universities and Colleges are, for the most part, utilized in this way, but the advantages derived from them are confined to a limited class of persons.

This educating the children in the schools in the elements of natural science is most essential, especially in country districts. When persons reach mature age without knowing about Natural History objects, they find it is then too much trouble to investigate these subjects. But by getting at them when young, by simple and forcible illustrations, they are bound to carry it forward with them to a certain extent, and if there should

come a time when they are in a position to give time to study, the first they will take up and pursue with patience will probably be some subject of this nature, merely for the pleasure of the study. On the other hand, if they have no inclination to work, they will not forget the pleasant hours they spent when they sat listening to some explanation of an object so familiar, which will create a tendency to put their hands to the bottom of their pockets and act feelingly. If children could be taught to see God in Nature and the wonders he controls, without cramming the brain with so much theory, by giving them a run into the country along with some one to explain, it would conduce a great deal to their general health and happiness. Country Museums want illustrating and simplifying as much as possible. Call a spade a spade, i. e., give the local name as well as the scientific one. This education would be another great saving to the nation if it were universal. Half the things that are dug up now are only saved by the merest chance, because the men digging do not care what they are striking their picks through. This would be altered altogether if they had been taught in early youth to take notice of the value and interest there is attaching, often, to things dug up from the ground.

Thirty-five years ago Professor Forbes said: "I cannot help hoping that the time will come when every British town even of moderate size will be able to boast of possessing public institutions for the education and instruction of its adults as well as its youthful and childish population; when it shall have a well-organized Museum wherein collections of natural bodies shall be displayed, not with regard to show or curiosity, but according to their illustration of the Analogies and affinities of organized and unorganized objects, so that the visitor may at a glance learn something of the laws of nature; wherein the products of the surrounding district, animate and inanimate, shall be scientifically marshalled, and their industrial applications carefully and suggestively illustrated; wherein the memorials of the neighboring province, and the races that have peopled it, shall be reverently assembled, and learnedly yet popularly explained; when each town shall have a library, the property of the public, and freely opened to the well-conducted reader of every class; when its public walks and parks (too many as yet existing only in prospect) shall be made instructors in botany and agriculture; when it shall have a gallery of its own, possibly not boasting of the most famous pictures or statues, but nevertheless showing good examples of sound art; examples of the history and purpose of design, and above all, the best specimens to be procured of works of genius by its own natives who have deservedly risen to fame. When that good time comes true-hearted citizens will decorate their streets and squares with statues and memorials of the wise and worthy men and women who have adorned their province—not merely of kings, statesmen or warriors, but of philosophers, poets, men of science, philanthropists and great workmen."

How far are we from yet realizing this ideal, and how slowly we seem to progress in so desirable a direction! Still there are many signs that the conscience of the nation is at last awakened, and if we see to it that all the discussions at present filling the air do not end simply in talk, but that practical good shall be the outcome, then our progress during the coming twenty-five years will not be so discouraging. In no better way can this ideal be realized than by an acute recognition of the place Museums should occupy in our natural systems of education.—*Thomas Greenwood, London, Eng., in Science.*

The Gopher Frog.

Through the kindness of Mr. H. G. Hubbard of Crescent City, Florida, I am enabled to make a note on the habits of the "gopher frog," *Rana areolata æsopus*, Cope. This form seems to be so rare in collections that so far the only specimen reported as having been identified with this sub-species is the type in the National Museum, from Micanopy, Florida, and described by Professor Cope in the Proceedings of the American Philosophical Society for 1886. I have been unable to find any published mention of its habits, which are peculiar.

It appears to be almost entirely subterranean in its habits, living in the holes and burrows of the "gopher" turtle, *Gopherus polyphemus*, in conjunction with it, and apparently on the best of terms. Roughly described, it is grayish green, with thirty-five or forty ragged black spots arranged in four or five irregular longitudinal rows on the back, and grading off into smaller spots on the flanks, while the legs are barred with about fifteen half-rings of black, from the thighs to the toes. Beneath it is white, with the throat marbled with very dark brown. The body is rather flat, with wide head and sharp-pointed snout, and the two dorso-lateral ridges together with indicated folds between them, are greenish brown. The size is about that of a small "leopard frog," *Rana pipilus*, or the "swamp frog," *Ranr palustris*, to which last it is closely related, although individuals are said to have been seen weighing two or three pounds. But those must have been huge toads, noticed by persons unable to distinguish between them and the frogs, or too unobserving to make the distinction. Its food has not been ascertained, from dissection of the stomachs of freshly captured specimens, but as these frogs are rarely seen away from the burrows, it is probable that they feed on the insects living in the burrows, for the holes possess a flourishing insect fauna, to a great extent peculiar to them.

On cloudy and rainy days the frogs sit at the mouths of the burrows—as many as three have been found in a single burrow—but on the approach of a human being dive down out of sight, and as the holes are from 12 to 20 feet in length, and 7 or 8 in vertical depth at the end, digging the frogs out is no easy matter, especially as the sandy soil has a tendency to cave in on the excavator. But the frogs may be successfully angled for with a fishing line and a small hook baited with a grasshopper.

In the fact that the burrows usually or always go down to water, may be found an explanation of the frogs inhabiting them, and the facility of procuring insect food therein may be an additional inducement, as well as their being safe hiding places. Nothing seems to be known of the habits of the other varieties of the species, of which also but few specimens are known, *Rana areolata areolata*, from Texas and Georgia, *Rana areolata capito*, from Georgia, and *Rana areolata circulosa*, the "Hoosier frog," found in Indiana and Illinois. It is to be hoped that further observations will be made upon this interesting species and additional specimens collected.—*Science.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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From this scene I wandered about amongst the old whale ships, which, like huge ghosts, reared high in air their whitened spars and exposed their bleaching sides to the hot sun, or lay, in various posture, awaiting as the case might be the hands of time or the renorvating touch of busy workmen, while upon some the carpenters were already at their labors. Then I walked up and down the narrow streets close by the wharves; I visited many of the shops and small warehouses; and amused myself in every way possible until, at length, aroused by the shrill scream of the tug-boat, I hastened to the scene of hurry and confusion consequent upon our starting for Penikese.

On arriving at the wharf, where the tug-boat lay, I found it literally one mass of moving heads and wagon-tops. Everything appeared to be in the wildest disorder and everybody to have lost their senses completely,—at least judging from the crazy manner in which people presisted in getting in each others way; nor was the confusion less noticeable on board the steamer, which was small and crowded. There were trunks, hat-boxes, valises, boxes, crates and baskets; general kitchen-ware, cooking utensils of all sorts and furniture mixed with Natural History stores and apparatus; all lying tumbled together so promiscuously and occupying so much room, that, in company with several others, I vainly wandered seeking a place of repose and momentary quiet from the human storm which everywhere surrounded me, and was fain almost to envy even the dirty little urchins, whom I had so recently left, their peace and quiet.

At length comparative calm reigned, and I found a moment in which to look about me, and to note the forms and faces of those gathered upon the deck and in the waiting-room of our little steamer—all of whom were eager for her departure. What a jolly set they were; these strange forms and faces! Old men and young men; elderly ladies and young, fair maidens. A varied group indeed,—yet, for all, it looked like an agreeable one.

When the second whistle sounded, a particularly shrill and startling one it seemed to me, what a scene ensued;—what a profusion of hand-shakings and good-byes were given and taken upon every side; slowly the tide of humanity poured down the boat's side and on to the wharf below. And now the steamer had completed its load. The dull beat of her paddles and her heavy column of black smoke announced that we had left the pier and were on the move. One by one the wagons started leaving the wharf; one by one the scattered groups of people turned from the dock and followed; then, finally, wharf, people and wagons grew further and further away as, with regular puff and plunge, the little "Helen Augusta" steamed quietly away from the dull, hot city, and out into a clearer atmosphere—upon the fair, heaving bosom of the bay.

Agassiz and Penikese.

Buzzards Bay! What a glorious mingling of land and water! Well worthy its illustrious discoverer, the famous Bartholomew Gosnald. In fact, both our little Penikese, and its larger neighbor, Cutty Hunk, have contended successively for the distinguished title of "Gosnold's Hat." Adown the broad bosom of this bay we glide. The passengers crowd the prow and stern of our small craft, to drink in the delicious draughts of cool, fresh air, that fan the cheek into fairly blushing at itself as it tells, so plainly to all around, its secret joy at this occasion: and this is the group most of whom are to bear me company, during a cooling summer sail, in an enterprise which is to unite professor and pupil, heart to heart and hand in hand; hearts devoted, and hands ever ready, to do the work which the Master shall assign them.

Our sail to Penikese was a very pleasant one,—and now mark our surprise: As we approach the wharf, there stood Professor Agassiz himself, who had thus anticipated our arrival, with beaming face, ready to welcome us; and his warm, enthusiastic shake of the hand, and gentle, winning words, which were ever new and fresh to each one, sent a glad thrill through each heart. How proud he looked. How like the kind, benignant father to us all that he indeed was.

After the handshakings, he lead the way, up the old lane or cartpath, to the place of meeting. There all seated themselves save Professor Agassiz, he alone remained standing. What a sight! What a scene! Would that some canvas might contain that picture.

The Hall, or place of meeting, was an old barn—still retaining its ancient, barn-like appearance without though entirely renovated and somewhat remodeled within. Great pains had been taken to leave its side and rafters as they had been, and bare,—yet perfectly clean. By a partition, was made a small, square room, at the farther end of which were ranged the chairs in which the pupils and company sat; in front was a long table, extending nearly across the room, around which the more highly honored guests were placed; behind and near the center of the table, stood Professor Agassiz, with head uncovered—with the fingers of one hand barely touching the table with their tips, and the other hand within the breast of his coat. In a moment all were silent:

> "Then the Master,
> With a gesture of command,
> Waved his hand;

and Professor Agassiz addressed us:

"My friends!" he said, "you know not what a pleasure it is for me to meet you all here today! I have looked forward to this as being a very happy event in my life, and I am not disappointed; but, before proceeding with our business, let us look to the giver of all our good things in thanksgiving. I know not any of you, therefore cannot feel free to ask of any of you that favor which I otherwise should do. I will ask you all, therefore, to join with me, for a few moments, in silent prayer." Bowed heads and silence responded to the call, as all joined in that solemn occasion,—and the waves dashing upon the rocks, seemed like the utterances of those unspoken words—while a thousand white-winged gulls, upon noiseless pinion, filled the air, and seemed like messengers from Heaven, awaiting only to catch the spirit of those words that they might bear them upward.

After a few moments the professor addressed us. He thanked us all for coming to meet him on that far off, lonely island, and he thanked himself for being able to be present; he thanked the kind giver of the island and its endowment, Mr. Anderson, for himself and for all, that he had been moved to such a generous bestowment of property and happiness to the community; and he thanked the friends there present at its opening for their sympathy with the

[TO BE CONTINUED.]

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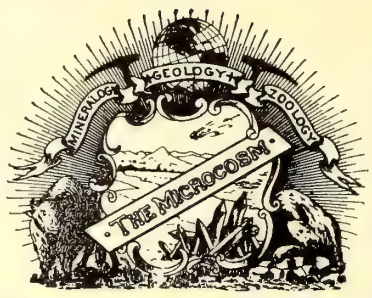

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NATURAL SCIENCE NEWS

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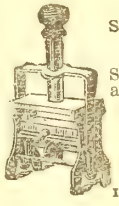

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VOL. I ALBION, N. Y., AUGUST 24, 1895. No. 30

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Mars.

The last of Percival Lowell's papers on Mars appears in the August Atlantic. He treats of the subject of Oases. In conclusion he says:—

To review, now, the chain of reasoning by which we have been led to regard it probable that upon the surface of Mars we see the effects of local intelligence: we find, in the first place, that the broad physical conditions of the planet are not antagonistic to some form of life; secondly, that there is an apparent dearth of water upon the planet's surface, and therefore, if beings of sufficient intelligence inhabited it, they would have to resort to irrigation to support life; thirdly, that there turns out to be a network of markings covering the disc precisely counterparting what a system of irregation would look like; and, lastly, that there is a set of spots placed where we should expect to find the lands thus artifically fertilized, and behaving as such constructed oases should. All this, of course may be a set of coincidences, signifying nothing; but the probability seems the other way. As to details of explanation, any we may adopt will undoubtedly be found, on closer acquaintance, to vary from the actual Martian state of things; for any Martian life must differ markedly from our own.

The fundamental fact in the matter is the dearth of water. If we keep this in mind, we shall see that many of the objections that spontaneously arise answer themselves. The supposed Herculean task of constructing such canals disappears at once; for if the canals be dug for irrigation purposes, it is evident that what we see and call, by ellipsis, the canal is not really the canal at all, but the strip of fertilized land bordering it,—the thread of water in the midst of it, the canal itself, being far too small to be perceptible. In the case of an irrigation canal seen at a distance, it is always the strip of verdure, not the canal, that is visible, as we see in looking from afar upon irrigated country on the earth.

Startling as the outcome of these observations may appear at first, in truth there is nothing startling about it whatever. Such possibility has been quite on the cards ever since the existence of Mars itself was recognized by the Chaldean shepherds, or whoever the still more primeval astronomers may have been. Its strangeness is a purely subjective phenomenon, arising from the instinctive reluctance of man to admit the possibility of peers. Such would be comic were it not the inevitable consequence of the constitution of the universe. To be shy of anything resembling himself is part and parcel of man's own individuality. Like the savage who fears nothing so much as a strange man, like Crusoe who grows pale at the sight of footprints not his own, the civilized thinker instinctively turns from the thought of mind of other than the one he himself knows. To admit into his conception of the cosmos other finite minds as factors has in it something of the wierd. Any hypothesis to explain the facts, no matter how improbable or even palpably absurd it be, is better than this. Snow-caps of solid carbonic acid gas, a planet cracked in a positively monomaniacal manner, meteors ploughing tracks across its surface with such mathematical precision that they must have been educated to the performance, and so forth and so on, in hypotheses each more astounding than its predecessor, commend themselves to man, if only by such means he may escape the admission of anything approaching his kind. Surely all this is puerile, and should be outgrown as speedly as possible. It is simply an instinct like any other, the projection of the instinct of self-preservation. We ought, therefore, to rise above it, and, where probability points to other things, boldly accept the fact provisionally, as we should the presence of oxygen, or iron, or anything else. Let us not cheat ourselves with words. Conservatism sounds finely, and covers any amount of ignorance and fear.

We must be just as careful not to run to the other extreme, and draw deductions of purely local outgrowth. To talk of Martian beings is not to mean Martian men. Just as the probabilities point to the one, so do they point away from the other. Even on this earth man is of the nature of an accident. He is the survival of by no means the highest physical organism. He is not even a high form of mammal. Mind has been his making. For aught we can see, some lizard or batrachian might just as well have popped into his place in the race, and been now the dominant creature of this earth. Under different physical circumstances he would have been certain to do so. Amid the physical surroundings that exist on Mars, we may be practically sure other organisms have been evolved which would strike us as exquisitely grotesque. What manner of beings they may be we have no data to conceive.

How diverse, however, they doubtless are from us will appear from such definite deduction as we are able to make from the physical difference between Mars and our earth. For example, the mere difference of gravity on the surface of the two planets is much more far-reaching in its effects than might at first be thought. Gravity on the surface of Mars is only a little more than one third what it is on the surface of the earth. This would work in two ways to very different conditions of existence from those to which we are accustomed. To begin with, three times as much work, as for example in digging a canal, could be done by the same expenditure of muscular force. If we were transported to Mars, we should be pleasingly surprised to find all our manual labor suddenly lightened threefold. But, indirectly, there might result a yet greater gain to our capabilities;

for if Nature chose, she could afford there to build her inhabitants on three times the scale she does on earth, without their ever finding it out except by interplanetary comparison.

As we all know, a very large man is much more unwieldly than a very small one. An elephant refuses to hop like a flea; not because he considers it undignified to do so. but simply because he cannot take the step. If we could, we should all jump straight across the street, instead of painfully paddling through the mud. Our inability to do so depends partly on the size of the earth, and partly on the size of our own bodies, but not at all on what it at first seems entirely to depend on, the size of the street.

To see this, let us consider the very simplest case, that of standing erect. To this every-day feat opposes itself the weight of the body simply, a thing of three dimensions, height, breadth and thickness, while the ability to accomplish it resides in the cross-section of the muscles of the knee, a thing of only two dimensions, breadth and thickness. Consequently, a person half as large again as another has about twice the supporting capacity of that other, but about three times as much to support. Standing therefore tires him out more quickly. If his size were to go on increasing he would at last reach a stature at which he would no longer be able to stand at all, but would have to lie down. You shall see the same effect in quite inanimate objects. Take two cylinders of paraffine wax, one made into an ordinary candle, the other into a gigantic facsimile of one, and then stand both upon their bases. To the small one nothing happens. The big one, however, begins to settle, the base actually made viscous by the pressure of the weight above.

Now apply this principle to a possible inhabitant of Mars, and suppose him to be constructed three times as large as a human being in every dimension. If he were on earth, he would weigh twenty-seven times as much as the human being, but on the surface of Mars, since gravity there is only about one-third of what it is here, he would weigh but nine times as much. The cross-section of his muscles would be nine times as great. Therefore the ratio of his supporting power to the weight he must support would be the same as ours. Consequently, he would be able to stand with no more fatigue than we experience. Now consider the work he might be able to do. His muscles, having length, breadth and thickness, would all be twenty-seven times as effective as ours. He would prove twenty-seven times as strong as we, and could accomplish twenty-seven times as much. But he would further work upon what required, owing to decreased gravity, but one-third the effort to overcome. His effective force, therefore, would be eighty-one times as great as man's, whether in digging canals or in other bodily occupation. As gravity on the surface of Mars is really a little more than one-third that at the surface of the earth, the true ratio is not eighty-one but about fifty; that is, a Martian would be physically, fifty-fold more efficient than a man.

As the reader will observe, there is nothing problematical about this deduction whatever. It expresses an abstract ratio of physical capabilities which much exist between the two planets, quite irrespective of whether there be denizens on either, or how other conditions may further affect their forms.

Animal Biology in High Schools and Colleges.

No one at the present day, questions the importance of animal biology in the curriculum of all well conducted high schools and colleges as well as in the better endowed universities and professional schools. The question is rather, how may this be accomplished? That there is a sad lack of competent instruction in these branches, even in schools that make it their business to educate teachers, cannot be denied.

The need is only too apparent but the laboratory method is not the way to remedy the defect in our smaller colleges and high schools, because it is beyond their financial ability to secure it.

This obstacle may, however, be overcome to a certain extent by the use of the stereopticon and lantern slides which may be had at a cost that is within the reach of any school board. The price of stereopticons has, within the past few years, been materially reduced and the quality greatly improved, so that now a good working lantern with suitable accessories for projecting photo-micro graphs on the screen, for ordina class work, may be had for a s as low as fifty dollars. Then ag the process of reproducing histol ical subjects has of late been so veloped that they may be had fr almost all dealers in school s plies at a nominal outlay. Y little has, however, been writt upon this method of illustrati lectures on physiology and giene in our public schools and is with this in view that I have dertaken the present article.

I have no hesitancy in saying, the outset, that a better und stauding of the histology of sues can be imparted to a grea number of students in a gi space of time by this means t can be obtained by the laborot method. I do not desire to understood as decrying the *pra cal working laboratory*. Wh time and equipment are suffici no better method can be had studying biology in all its phas but where either of the above sentials is lacking the lantern comes a valuable substitute, even where the laboratory met is employed I have found the tern a very valuable adjunct in parting a general knowledge the subject. As a method of lustrating didactic lectures on tology I consider it far ahead charts. In its use the matte "personal equation" is reduced the minimum, and it carries more vivid impression of the o inal tissue because of the fact t it is a photograph. In the use the lantern the educated sen are appealed to and valuable t saved that in the laboratory me od is spent in learning the te nique of the microscope which after years is of little avail unl the individual continues in pra cal laboratory work. If the ject sought is the making of croscopists and original investig ors then use the laboratory me od combined with the lantern class demonstration, but if time equipment is a desideratum lantern will be found to be f adequate for good class instr tion. Ten years' experience as teacher of biology leads me speak thus positively on this qu tion. Trained in the best Germ laboratories I naturally follow their methods when I began tea ing. Gradually the lantern v introduced to illustrate didac lectures. At first, use was ma of the oxyhydrogen lime light projecting actual tissues upon screen. Many valuable specim

were lost by over-heating. Various cells were introduced to prevent this, but they shut off the light to such an extent as to minimize results desired to be obtained. I was led to substitute solar light for the lime light, but the uncertainty of the results led to its abandonment in favor of photomicrography, and now with an inexpensive oil lantern better results are obtained by this process than formerly with the most expensive stereopticons, under the most favorable conditions. I make my own photomicrographs and find it a delightful recreation. In past years I used to keep on hand an extensive cabinet of microscopic slides for reference. These have latterly been discarded for the photomicrographic negative. My custom now is to photograph all points of especial value as I am studying and file the negatives away for future use. But little time is required for the work when one has a dark room handy which is fitted up for it.

The objection has been offered to photomicrography in that it only reproduced the slides in light and shade. To overcome this objection I have invented a process by which it is possible to reproduce the original stains of the microscopic slide in the lantern positive, in double stain if necessary, and that without hand painting as was formerly required.

In conclusion let me reiterate that by adopting the lantern and photomicrographs the subject of animal biology may be successfully brought before the classes of our high schools and colleges, now debarred from its study by lack of suitable equipment.—*W. Xavier Sudduth, A. M., M. D., in Science.*

Bird Notes.

By Morris Gibbs.

What one of the birds moults first? * This question is difficult to answer, but from observations of over a score of years in this section, southern Michigan, I am pretty well satisfied that the Bobolink is among the first, if not the first to moult. The moult begins by the 20th of July, and sometimes by the middle of the month. At the date of writing flocks of these birds may be seen in low fields and meadows, and a queer looking lot they are. No one, unfamiliar with Bob would recognize him in his peculiar dress of mixed design. The black coat and white spots have disappeared, and the dingy appearance of his once prominently marked dress, is in marked contrast to the gay appearance of May and June. The complete moult occupies considerable time, and throughout the condition the birds continue to flock and keep low, never rising much above the fences and weeds. Soon the males and females are of one color and the sexes cannot be distinguished as they settle about you, or rise and fly a few rods uttering their tinkling call notes. The once dashing songster no longer rises on flutter ing wing to stimulate us with his ecstatic, rollicking song. He is content to remain silent in the meadow with his mate and offspring and only utters a few faint notes as he gleans in the marsh or field. The notes are common to both sexes. Soon these augmenting flocks will leave for the South. In the East they are called Reedbirds and are shot for the city markets. Farther south, where the rice fields of the Atlantic and Gulf States offer food and shelter, they are considered a great nuisance and are killed in vast numbers; the slaughter answering the double purpose of getting rid of a pest, as well as supplying the shooters with a most palatable dish.

What one of our birds moults last? Undoubtedly the Goldfinch, as it rarely drops its full summer dress until October and I have shot a male, still in its bright yellow plumage, on October 21st. A friend of mine took a Goldfinch's nest with fresh eggs in September, and certainly this species, as with all others of my acquaintance, does not change its dress until nesting duties are fully finished. By the term, completion of moulting, I mean the rehabitation of a bird; the finishing of its season's change of plumage. The period of moulting depends on certain conditions affecting both sexes, and these conditions are largely dependent on the nesting season. In the large majority of cases the birds begin to moult within a month after the nesting duties are completed, but this is not a rule by any means, as will be shown in the case of the Bluejay and Crow.

Therefore it follows that the Hawks and Owls are among the earlier birds to change their coat, and this is so; and out of over 100 hawks, of seven of our common species, shot in early September, only six gave the slightest evidence that the process had not been fully completed, while the Owls were all perfect. Yet at the same date, of 206 Bluejays and over 40 Crows which were examined, three-fourths of the Jays gave evidence that moulting was still in progress while pin-feathers still covered the heads of many specimens, and several Crows plainly showed evidence of feather-shedding. * Herons of two kinds and two bitterns, evidenced completion of the process, as did also a large number of Kingfishers.

Hawks and Owls, who are universally credited with raising a single brood in a season, as also the waders, moult early. Every collector has seen flocks of Least and Semipalmated Sandpipers and Semipalmated Plovers on the shores of our small interior lakes by August 10th. It is well-known that these small waders generally breed well to our north and only appear with us after nesting and moulting. At least I have yet to meet with these summer visitors from the north who gave evidence of present moulting.

In conclusion reference must be made to the so-called English Sparrow. This species, rapidly becoming cosmopolitan, like the rat, mouse and some other nuisances, is perhaps altered in habits and therefore cannot be taken as a standard—at least we hope not. Strangely enough, this imported pestiferous *passer* varies in the time of its annual after breeding moult August 1st to October 20th; being probably regulated in this condition by the completion of its nesting duties. Contrary to the generally accepted belief that the English Sparrow raises five and six broods each season, and the Robin and other common birds rear three broods a year, I maintain that all of them rear but two broods each season. The extravigant efforts of the importation do not prove that it ever rears over two broods a year. But more of this at another time.

* The American Crossbill, a Michigan bird, probably moults early as it is a very early breeder according to some authorities, but I do not include it here as it is not a summer bird in the southern part of the state.

* Observations drawn from the examination of birds shot in the prize contest for killing [game and fish destroyers]. The writer was appointed judge in the contests held in September, 1892-'3 and '94. The notes above apply to the Hawks and Owls taken during the three years, but the Crows and Jays spoken of are of the year 1893, Sept. 11-12, at Kalamazoo, Mich., annual hunt of the Kalamazoo Fish and Game Protective Association.

PENIKESE—A Reminiscence.

By One of its Pupils.

Copyright secured 1895.

plans of the trustees for the institution, as well as for their hearty co-operation in furthering those plans: Then he thanked God for his goodness to them all. After this, speeches were made, and many prominent public men took part in the tributes of praise that were bestowed freely upon all interested in the school,—whether teachers, pupils, or any that sympathized with the grand work thus initiated,—and the company broke up, happy and pleased with their first public introduction to Penikese.

Our first day at the Island, thus it began! It was intensely warm, and the sun shed down its almost vertical rays upon a soil, dry and sandy, with scanty vegetation, though with a liberal supply of rocks and boulders, which were scattered everywhere about the place. Viewed simply in itself, it was a most unattractive spot, and at first I could scarcely persuade myself that I should enjoy my stay here,—yet for all the unattractiveness of the place, a secret something filled my mind with pleasant thoughts, and I found, even in the rocks and boulders, and the dry, sandy soil, with its occasional patches of green, a solace for all the objectionable features of the situation. We had met together upon this desolate island, a band of brothers,—stranger brothers as yet, to be sure,—but, although still unacquainted with each other, a common bond of sympathy was drawing us uearer and nearer one to another—master and pupil—in a friendship that was to last a life time. Thus, at the very beginning, each rock, each grain of sand, each blade of grass even, was invested with an interest, which increased daily as the Master's hand directed our attention, and his thoughts our thoughts, to the—to us at least—hitherto unimagined wonders of the objects lying everywhere about us. Drawn by a common union of mind, sentiment, and purpose, they had met together, from all parts of the United States, two score and ten specialists—old and young, men and women—teachers to be instructed of teachers. All faults and differences were forgotten, if indeed there were many to forget, by mutual consent, as each worked for the common good of mankind. No wonder that the influence of these persons is felt today everywhere, throughout the length and breadth of the land, as they reflect the light of that wonderful man, Louis Jean Rudolph Agassiz. Love makes even duty a pleasure. One short hour, and we loved our instructors and our companions; we loved our little sea-girt island,—for all its barrenness. We looked upon everything about us with a sort of reverence. All had a meaning now. Do you wonder that I remember those days as some of the happiest of my life? But active preparations for dinner are going on, it would amuse you to see them.

Our first dinner had, for the most part, been prepared in New Bedford, and brought over with us in the boat. The room in which we were to dine was almost square; and the doors opened near the centre of one side of the building and next to the partition, which separated the dining-hall from the kitchen. Close to the windows, upon either side, were two long tables running lengthwise of the hall, which were intended for the students; a third table, running crossways and with its ends directly in front of the entrance, was for the use of the professors and their families. We regarded ourselves as really quite in fashion, upon this occasion, for such an out of the way place. There were rough, homely chairs placed evenly and closely to the white table cloth and neatly set tables; the dishes were plain, though not coarse; and the food simple yet healthful. All things seemed exactly fitted to the occasion. Were we inclined to grumble a little, at first, at both our food and our accommodations; we who have been accustomed to the best? If so, nobody complains now,—when professor and pupils share alike. The Hall was crowded that first day. As soon as one had finished, new plates were laid and another occupied the place; but our waiters were so well trained, that we scarcely had occasion to remember this as a first meal. Although taking some time to accomplish it, our party were at length all well provided for; and the visitors, after having given and taken most hearty and cordial adieus, hastened on board the little steamer once again, and were soon on the way to their respective homes. The school had been advertised to begin upon a certain day. Up to within a few weeks of its commencement, almost nothing had been accomplised saving the transfer of the island from Mr. Anderson to its trustees. The friends of the institution were despondent. The day for the opening arrived, everything was ready. The enterprise was a grand success.

It was with a strange feeling that I watched the "Helen Augusta" as she left the wharf, and steamed far out into the bay. I had taken my station in the old forts, upon the highest part of the island,—it looked as if it might be centuries old, perhaps built by the famous Bartholomew Gosnold himself, the early discoverer of these regions; and from thence I watched her as she grew farther and farther away,—then her hull aud smoke stack became fainter and fainter; then a long line of smoke, hanging heavily along the horizen, with a small, dark speck just beyond it; these, too, soon disappeared. Then, for the first time, I realized that school had begun.

After considerable delay, our baggage was transferred from the wharf, in the most primitive manner imaginable—by a yoke of oxen, and an odd, old fashioned tip-cart,—to the door of the dormitory; then came the rush for claiming property. To have seen the scrambling, one would hardly have believed this to be part and parcel of the quiet orderly assembly of but a few hours previous. How each box, bag and trunk found at last its respective owner, is a mystery that I will not attempt to explain,—yet it was at last accomplished, to the complete satisfaction of all parties.

Our dormitory, though a strange looking affair, was most admirably adopted for the purpose for which it was intended. It was a long two-storied building, standing, if I remember correctly, northeast by southwest. The upper floor was, as yet, in an unfinished condition,—though the carpenters were now busy completing it; the lower room, like the upper, long and narrow, was divided into two compartments, of about equal length, by means of sailcloth suspended from a cord running high up across the room. Of these two apartments that facing the bay was occupied by the ladies, that facing the island, by the gentlemen. The inside arrangements were similar in both.

The interior of the men's apartment was arranged with a long aisle extending from the door through the centre of the room, upon either side of which were ranged a dozen or more cot beds. At the foot of each bed facing it, with but a narrow passage between, stood a bureau; and a little to one side of its

[TO BE CONTINUED.]

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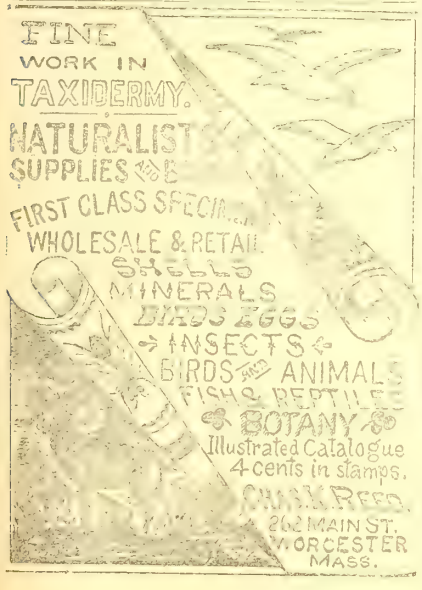

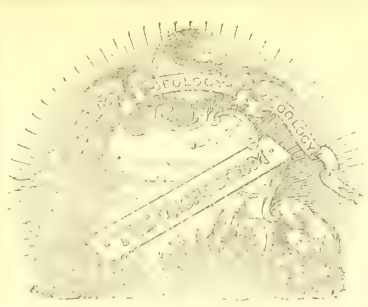

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NATURAL SCIENCE NEWS

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All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

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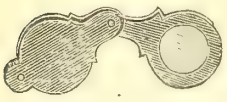

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Natural Science News.

VOL. I ALBION, N. Y., AUGUST 31, 1895. No. 31

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Head of Prehistoric Monster Embedded in Bitumen.

A remarkable discovery was made some weeks ago in the asphaltum mines in Kern county, when miners working 120 feet below the surface excavated the skull of a prehistoric monster.

The bones were embedded in the asphaltum deposit, and in close proximity were pieces of wood in a fair state of preservation, though hardened and blackened like Irish bogwood of forests belonging to a far away geological period. Fossils in the earth are nothing uncommon, but this skull or jawbone is more than a fossil, which fact give it a peculiar significance in study of geology and natural history. There are several teeth in the jawbone that still have a coating of enamel, which proves that æons of ages ago beasts moving amid the desolation of earth had teeth differing none either in texture or form from the present age. The enamel is well preserved in color and substance, though inside it the dentine is changed to asphaltum.

The head is not perfect, as part of it had either turned to the black substance itself or rotted away, although there remains enough to show that it was larger than a horse's head and shaped like that of a moose. The teeth are larger than those found in a horse, being about three or four inches long and one and one-fourth inches wide, and they are arranged in long rows, showing that the extinct creature had a mouth built for heavy business. From the forehead a massive horn protrudes like the spike of a rhinoceros, but of a different shape, being flat and resembling the broad portion of the deer's horns. It gives the head a formidable aspect. Now it is merely asphaltum that indicates the bone fiber.

As a scientific discovery the importance of these fossiliferous fragments can be appreciated when it is known that scientists differ regarding the origin of asphaltum. Some of the most eminent geologists have satisfactorily reached the conclusion by inductive processes that it is a mineral formed by certain chemical action, while others whose standing entitles their opinions to quite as much respect, claim it is a vegetable substance, or at least organic, and probably was animal matter similar to that found at the bottom of the ocean.

The fragments are now all packed ready to be sent to the University of California, where they will be classified, if possible, and preserved as some of the most interesting specimens in the Berkeley Museum of Natural History. The fragments embedded in asphalt will also be forwarded, and no doubt there will not be much difficulty in determining its species. The discovery and preservation of those exceedingly valuable specimens are mainly due to Bernard Bienenfield, a civil engineer connected with the mines at Asphalto, who studied at the University.

"It deals with the mysterious," said he, while describing some of the wonders of the study in the almost scientifically unknown region of Asphalto. "It brings us to think what might have been. The mysterious study opens up a new world to our view."

"And is it really so wonderful?"

"Well, who can explain it all? Asphaltum is supposed to be of animal origin, or vegetable origin. The theory that it is from the animal matter of infusoria.

"And here—see for yourself—we have a well-preserved head of an animal hewn out of the asphaltum deposit 120 feet down in the earth. I would not wish to set up an opinion or draw an inference from this fact, but it does impress me strangly that this head was part of the animal remains that formed asphaltum. Possibly it was millions of years ago—who knows? Who can count the geological periods by years? Time is lost in it. And, think of it, here are teeth with the grey enamel still firm, still smooth and shiny, in the asphalt."

He unpacked the fossils with extreme care lest pieces of the friable stuff might crumble off at his touch. Remember, strictly speaking, they are more than fossils, for the teeth are enameled, and fancy the sensations of handling portions of a creature that moved and had its being countless of ages before this world was ready for man!

One package contained a piece of jawbone showing the teeth on the outer side, another showed sections of teeth and the bone in which they were imbedded with mere shell-like covers for asphalt that was dentine. A tooth curved like a segment of a circle, fully three inches long and one inch by one and one-fourth in section, and weighed nearly a pound. The horn is a horrible thing to look at. It measures about six inches in length, eight inches in width and from two to half an inch in thickness. This stood direct between the animal's eyes, and must have proved a most persuasive feature in his way of arguing.

Among the other interesting pieces is a jawbone seven inches long, in a good state of preservation, and clearly showing the bone fiber, although really nothing but so much asphaltum, save where the enamel projects. They will have to be put together by the professors at the university, who may be able to reconstruct a complete skull of a prehistoric animal that roamed over California in the tertiary or quarternary period.

Practically little geological work has been done in the regions where the fossils were found. Just 50 miles to the west of Bakersfield, high up in the desolate mountains skirting the western San Joapuin valley, this strange land lies. Blinding ashes and parched dust, pools of liquid asphaltum and streams of that pitchy viscid stuff trickling from cracks in the hillsides; creeks and little lakes of sulphurous water emiting a gas that ignites and blazes, great masses of bitumen protruding from the ground like lava grown

cold; all these together and a soil on which a strange stunted underbrush grows, form its characteristic landscape.

There are large beds of infusorial earth 300 to 400 feet thick and extremely light. The surface is bleached intensely white by the sun burning out the little asphalt oil on top. Underneath is a brown, impalpable dust like volcanic ashes —a mighty ash heap and yet composed of shells of the infusoria, visible only under a powerful microscope.

From the presence of this dust it may be taken that asphalt is infusorial also, being formed out of animal matter, of infusoria, while the mineral matter, or white shell dust, remains above it.

There are beds of brown sand, almost a sandstone, parallel to the direction of the asphalt deposits, and seemingly underlying them in the strata. This brown sand coheres through the agency of asphaltum material in it, and has stood like a dike against the erosion of geological periods.

One more interesting feature of the district is the mineral tar, as it is commonly called, or liquid asphaltum. It exudes in many places and trickles down hill until a hollow is reached and black pools are formed. In those pools lizards, beetles, rabbits, birds, and even a deer and a bear have been found, all embalmed by the liquid that kills them.—*Bakersfield Californian.*

Reproduction in Animals.

In animals there are two kinds of reproduction—sexual reproduction and asexual reproduction. For sexual reproduction two kinds of cells are necessary, the egg, or germ-cell and the sperm-cell, coming generally from distinct individuals. From the union of these two cells the embryo is developed. The essential parts of the gem-cell or egg, are three, viz., the germinal vesicle, which prehistrimary part, being a particle of protoplasm, the yolk, which serves as food for this, and the vitelline membrane, in which the germinal vesicle and the yolk are enclosed. When a large amount of yolk is present, it may be divided into formative yolk and food yolk. Food yolk is distinguishable from formative yolk by its more oily nature. The structure is more complicated in the egg of the hen. Externally is a hard, porous shell, consisting of a deposit of lime in a net-work of animal matter. Lining this is the *membrana putaminis*, a delicate, double membrane, which separates at the larger end to enclose air for the chick's use. Next in order is the albumen, in layers arranged spirally, and within this is the vitelline membrane containing the yolk. On the outside of the yolk is a white spot of cellular structure, the *cicatricula*, or embryo-spot. It is, however, no longer in its initial stage, development having already advanced before the laying of the egg.

The shell and albumen are wanting in most eggs, or when albumen is present it is usually covered only by a tough membrane. The envelope of the eggs of *Crocodilia* is like that of birds, while in *Carcharias vulgaris* it is of a horny texture. The egg of the Sponge resembles an amœboid cell. It is the quantity of yolk which mainly determines the size of an egg. The yolk is minute and formative in the eggs of an *Asteroidea*, *Vermes*, *Insecta*, *Mollusca* (excepting the Cuttle-fishes), numerous *Amphibia*, and *Mammalia*, while it is large and colored and consists of the formative and nutritive parts in the eggs of Lobsters and Crabs, *Cephalopoda*, *Araneina*, *Pisces*, *Reptilia and Aves.*

The eggs of *Crocodilia* and *Aves* are elliptical or oval in shape; of *Vespa* and *Chelonia*, spherical; of *Diptera* and of the *Apis* and *Bombus*, cylindrical; and of the *Carcharias vulgaris* they are shaped somewhat in resemblance to a hand-barrow, having tendrils on the corners. In some of the lowest forms the eggs are covered with prickles or hairs.

Concerning the number of eggs of different animals there is a great variance, proportional to the risks during development. The Queen-bee lays about a million eggs during her life, and the spawn of an Oyster contains 6,000,000.

As far as the care of the eggs after deposition is concerned, it is a general rule that those animals which receive the longest and best care while in the embryo state, ultimately attain the highest step of development.

The Protozoa reproduce by conjugation. Two individuals unite into one mass, and surround themselves with a case. Within this they divide into several parts, each of which becomes a new individual. The Sperm-cell differs from the egg in the following respects: it is generally motile, very small, and from one reproductive cell a large number of them are usually produced, which is not the case with the egg, that being the entire primary cell. Development occurs only when there is a union of the sperm-cell with the germinal vesicle.

Asexual Reproduction is of two kinds—self-division and budding. Self-division is the separation of the body into distinct parts of which each is then a new animal. This division may be either longitudinal or transverse. Only those animals whose organs and tissues are simple in structure and easily bear division have this form of asexual reproduction, as, for instance, Protozoa, Polyps and Vermes.

Budding is somewhat akin to self-division. In self-division the off-spring receives a part of the parent's organs, while in budding one or more cells of the original animal develop and multiply and grow into an animal resembling the parent. Sometimes the buds remain attached to the parent stock, forming a colony as in Bryozoa and Corals, and the process is then called continuous budding. In Hydra, Aphis and Daphnia this separation takes place when the bud is developed, while among some animals these buds are internal, and are separated when no development has taken place, and then resemble an egg in appearance. Nevertheless they develop without fertilization, differing in this respect from a true egg.

O. A. Dahms,
Davenport, Iowa.

Object Teaching in Town and Country.

Decidedly things are moving. Constantly, some say too constantly, we urge the necessity of a return to nature in our methods of elementary education. The art of printing has done much for man, but the printed page too often inserts itself between our eyes and the realities of the world. Our cry, therefore, has always been—less book teaching, less giving of information, let children learn for themselves by the old way of the five senses, let science be learned by the individual as it is learned by the race, through observation and experiment. But, as we said, things are moving, and soon there will be little left for us to urge.

In our April number we mentioned the addition to the Educa-

tional Code that permits the time spent in visits to museums under proper guidance to be counted to the children as time spent in school-work. The account of a meeting at the Whitechapel Museum, reported in our News pages, shows that the teachers are taking this permission in earnest, and that there are at least some curators thoroughly in sympathy with the aims of modern educationalists. But, like the text-book, the museum is only a substitute, and in our editorial of April, we put forward the claims of the hedgerow and the quarry to a place in our own system of teaching. We rejoice to see that the prophecy on which we ventured is even now being fulfilled.

A remarkable and inspiring circular (No. 369) has just been issued from the Educational Department to H. M. Inspectors of Schools. It is entitled "Object Teaching," and is prefaced with some admirable remarks by Sir George Kekewich. First, he draws the distinction we have so often emphasised between observation of the object itself and information about the object. It should be always remembered," he says, "that in Object Lessons the imparting of information is secondary to the cultivation of the faculty of observation." He distinguishes object teaching from instruction in natural science: "It it Elementary Science only in so far as it aids the child to observe some of the facts of nature upon which Natural Science is founded; but as it deals with such topics without formal arrangement, it differs widely from the systematic study of a particular science." Science teaching belongs to a later stage of mental discipline. "In Object Teaching the chief interest in the lesson should centre in the object itself." Summing up the uses of object teaching, Sir George says: "The first and most important is to teach the children to observe, compare and contrast; the second is to impart information; and the third is to reinforce the other two by making the results of them the basis for instruction in language, drawing, number, modeling and other hand-work. There are, however, other important uses of good object teaching. It makes the lives of the children more happy and interesting by opening up an easily accessible and attractive field for the exercise of brain, hand, and eye. It gives the children an opportunity of learning the simplest natural facts and directs their attention to external Objects, making their education less bookish. It further develops a love of nature and an interest in living things, and corrects the tendency which exists in many children to destructiveness and thoughtless unkindness to animals, and shows the ignorance and cruelty of such conduct."

But the chief point in the circular that has attracted our attention is one that may easily be overlooked. After speaking of visits to museums as advantageous in connection with object teaching, it proceeds, "Occasional class excursions out of school hours (or, if the instruction be in accordance with Art. 12 (*f.*) of the Code, in school hours), under proper guidance, will enable teachers both to provide suitable Objects and to confirm previous impressions. It should be borne in mind that Objects, when they are brought into the classroom, cannot be there studied under their ordinary conditions; and therefore it is important by a proper use of such expeditions to let the children see what part the Object plays in its usual surroundings." When we turn to the list of objects suggested as appropriate to these lessons, we find among them "Caves by the sea formed by the waves; caves inland formed by rain dissolving limestone. Springs and running water. Study of flow of stream. Study of seashore;" while for children in towns are suggested "River or canal, according to circumstances. Atlantic liners. The park or public garden." It is pretty obvious that seashores and Atlantic liners cannot conveniently be brought into the ordinary class-room; so that outdoor excursions are a necessary corollary of Circular 369. We sincerely hope that the teachers, with whom after all the initiative must lie, will not be afraid of laying on themselves too great a burden, and we trust that they will not be prevented from putting these ideas in force by the apprehension, far too common among them, that a day in the country, or an hour of school time spent anywhere but in the school house, means a loss of marks and a consequent reduction of grant.—*Natural Science* (London).

A New Cave.

Prof. Gordon Curry, dean of the College of Pharmacy of this city, and a botanist of some note, accompanied by Mr. Hugo Soltau, an enthusiastic naturalist of New York, spent yesterday in the neighborhood of Rockhaven, 30 miles from Louisville on the L., St. L. & T. Road, searching for rare plants and insects. While near Rockhaven they discovered the mouth of what proved to be a cave over three miles long. The cave is filled with stalactites and stalagmites, some of them in course of formation. About half way in the cave they found an underground river with a temperature of about 40 degrees, or just about the freezing point. They crossed the river, which was in some places four or five feet deep, where Mr. Soltau found some rare insects of the beetle species that have no eyes or places for eyes.

In speaking of the discovery last night at the Louisville Hotel, Mr. Soltau said: "The insects that I found are of the beetle species, whose technical name is *anophthamus tenuis*, and I never found or heard of any of their kind anywhere else. They have no eyes, and nature seems to have made no provisions in them for these organs. They are a small insect, and I found them in the crevices of the rocks inside the cave. They were gotten from the crevices by dashing water against the walls of the cave. The cave is one of the prettiest I ever saw. It is something near three miles long, as near as I could judge, and we found some beautiful stalactites and stalagmites in it in all the processes of formation. Prof. Curry found lakes of the calcareous matter from which some of them are formed, and some of the unfinished stalactites were as beautiful as I ever saw in my life.

"The river wound across the cave in a zigzag fashion, and the water was as clear as crystal. In some places it was four or five feet deep, and in other places it widened out into little pools that were perfectly limpid. We were surprised to find that it was ice-water. The temperature of the cave was about 60 degrees, and, of course, the water was considerably colder. We waded the stream and went to the end of the cave, or as far as we could see that the cave extended. The cave is reached only after a hard climb up a steep hillside. The mouth is so small that it is necessary to crawl in order to get into it, but the opening soon gets wider, and finally it looks like a dome above you."—*Louisville Courier-Journal.*

PENIKESE—A Reminiscence.

By One of its Pupils.

Copyright secured 1895.

head a small washstand, with its accompanying necessary furniture. A chair, and a simple tallow dip and tin candlestick, with a few matches in it completed each person's outfit. Our trunks were placed behind our bureaus, and our valises, anywhere that room could be found for them.

We were obliged to pass our first night almost in the open air. The window-sashes were without glass, and the cool breeze swept through the long room unrestrained; but it was not uncomfortable, and we did not mind it greatly. It was late in the afternoon before I had unpacked and satisfactorily arranged the books, clothing and shooting and other materials which I had brought with me. When it was at last accomplished, I threw a shawl over my bed, put on my slippers, and lay down to rest. I had placed the pillow at the foot of the bed, that I might the better drink in the delightful air and the broad ocean scene which spread itself, in all its freshness, before me. What a lovely view it indeed was! My eyes rested upon a gentle sloping bank of the most delicate, velvety green—appearing the more beautiful from the scantiness of the surrounding vegetation—extending to the sea itself, which rolled long lines of low surges lightly toward it. Further on, dancing billows and light whitecaps played merrily in the sunlight of the departing day. Then the surface of all the water was tinged with the most fascinating shadows from the dark, fleecy clouds above; they changed constantly; yet their very changes only made them the more beautiful. In the far distance, sail after sail would appear and disappear as a mere speck of light, visible only by long watching. Now a sail would shine, white and clear, before my very eyes,—another and another, farther on; the shadows had hidden them before. There were nineteen of them in all—and, in the distance, two large, three-masted schooners. Then a steamer left a long, dark haze of smoke upon the sky—poking its tall, black stack into sight for a moment only to disappear, like many of the sails, a long umbre cloud which lay against the horizon. At last satisfied by the scene, and fanned by the delicious atmosphere wafted in at my window, laden with that peculiar salt sea air, so intoxicating to a true sea lover, I fell asleep, to dream that I was far out upon the ocean, and being softly rocked to and fro from the "Nest" high up on the foremast, by the winds and gently rolling waves.

I do not know how long I slept, but I awoke with the most delightfully refreshed sensation that one can imagine, and ready for almost anything that should present itself. I will not here enter into a discussion of the question, as to how much sleep the human frame needs, at what times, and for how long, a time; for I am a firm believer in the theory, that nature herself will not only inform us as to when we should sleep, but will also determine for us how long we should sleep. So far, at least, my theory has never failed me. And now, after a most refreshing slumber, I awoke and returned once again to the realities of life.

Upon arising, I found my companions still busy arranging their effects. Though everything seemed in apparently the most endless confusion, with everybody and everything in everybody's way, there was not a person present whose face did not glow with happiness, and the most eager and intense enthusiasm. Each seemed specially to have partaken of the spirit of our leader, who was everywhere,—encouraging, aiding and directing. The workmen were completing their unfinished labors, and he was guiding them. What a sight to watch him! He was neither haughty nor reserved, as many who were unacquainted with him would fain have had us believe; but he mingled freely with all. His genial face, and the sincere, earnest tones of his voice, attracted everybody; while his approval of the work already done, and the directions for the furtherance of his plans, were given as if to equals rather than to servants paid to obey him,—nor did I hear a word of complaint spoken,—against Professor Agassiz for any cause whatever, by anybody, while I was upon the island.

Penikese and Agassiz.

Supper time at last, our—our second, though really our first, meal at Penikese. The cooks had come to the island in the same steamer that we ourselves had arrived in, and were hardly yet fully established in their new quarters,—one could hardly expect everything to be perfected at once. It was no easy task, that of opening and arranging boxes, bags, and barrels, and sorting and storing their contents. Then preparing the food for the table, with the limited supply of culinary articles yet at their disposal, would have taxed the patience of much more angelic individuals than those same "colored brethren" were supposed to be; but the supper, like the dinner *was on time*,—as was everything that Professor Agassiz superintended.

There is a trite old Latin adage, that reads, "Fames bene condimentum est," better known as "*hunger is the best sauce*,"—and I do not believe that there was one amongst us that night, who did not fully enjoy all that had been provided for the occasion, notwithstanding the difficulties under which it had been prepared.

After supper "the school" scattered about the island in every direction, singly or in groups which were soon all lost sight of behind the hillocks and surrounding rocks. As to many the position and general appearance of Penikese may be unfamiliar, I will try to give you a glimpse, though a very imperfect one, of its location, its surroundings, its beauties, and its attractions; yet how I wish that you might have seen it as I saw it, and know it as I knew it.

Penikese Island is situated almost directly south of New Bedford, though perheps inclining a few points, as the sailors say, to the westward, and is fourteen miles from land. About three miles south of it lies Cutty Hunk, which was, at the time our school first opened, owned, in part at least, by a New York club, the members of which spent their summers there in fishing, hunting, and in yachting. About the same distance from Penikese, and east of Cutty Hunk, lies Nashawena. It is an immense island, and is nearly fourteen times the size of its little near neighbor, our Penikese. Still farther eastward lie Pasque, Naushon, Nonamessett, Uncatina, and the minute Weepecket, ranged, with the exception of the last, one after another, in a crescent, and the last separated by only a narrow strait of water from Wood's Hole, as it is on the maps, though someone has perverted it into Wood's *Holl*, the extremity of the mainland in this direction. The "old-timers," of New Bedford and its vicinity, arrange the names of these islands in a little verse which, they say, enables

[TO BE CONTINUED.]

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A Cabinet Collection of Sea Shells, etc. Sold under a guarantee of being first-class Shells and perfect Specimens scientifically named.

Fulgur perversus, 4 inches long	....	20c
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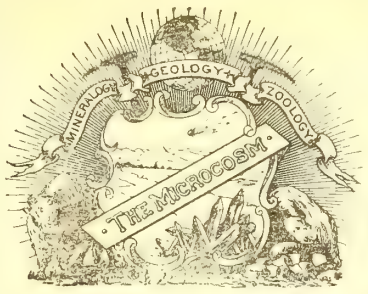

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These Collections are suitable for a Private Collection or for a High School or College Museum. They have been arranged with special reference to their value for Study purposes.

Address,
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N. B.:—A State University has an eye on the mineral collection and an active Collector on the one of Shells; however, if you *write quick* you might catch either.

Florida Coast Shells

at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

We therefore make you the following offer: From now until October first we will fill all small orders for Sea Shells at very little more than the actual cost of packing and postage.

We will fill any order from ten cents to $2. and give you a finer and larger collection for the money than you ever had before.

We have large quantities of Florida coast and river shells, and we take this method of reducing our stock before the autumn collecting begins.

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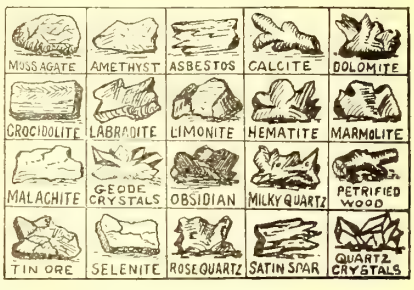

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52 Specimens, all named, such as usually sell for 5 and 10 cents each. Will send prepaid for only $1.00.

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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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Attention Entomologists.

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The following butterflies put up in papers: Sapilio turnus, Sapilio troilus, Sapilio asterias, Sapilio ajax, Danais archippus, Colias philodice, Megan cæsonia, Eurema Mexicana.

Also the following pupæ and cocoons alive: Turnus Troilus, Asterias, Ajax, Nudulosa, Hylacus, Abbottii, Octomaculata, D. Myron, D. Vemicolor, Ceanothi, Gloveri, Columbia, Excæcatus. Myops, Zeminatus, Juglandis, Thysbe, Augulifera.

Write number and lowest price. Must be all A No. 1 specimens. All letters answered.

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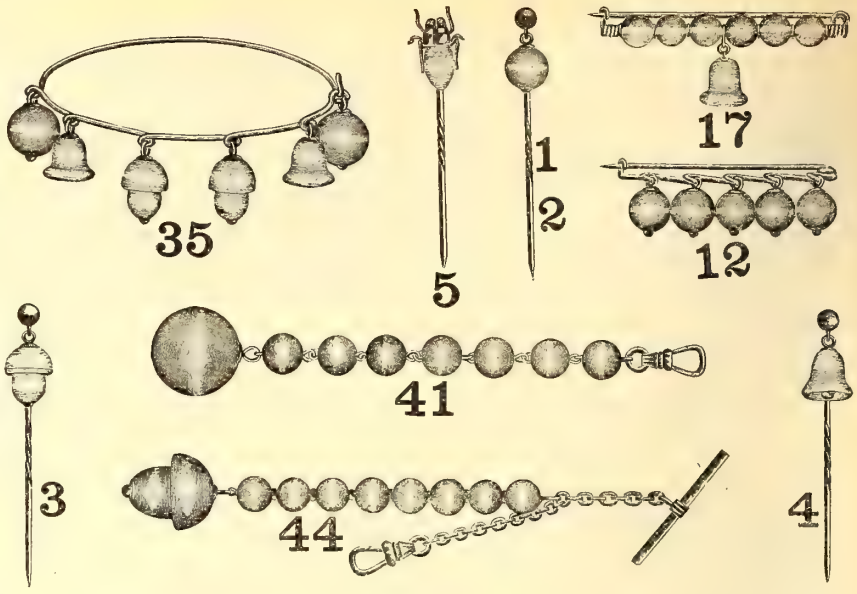

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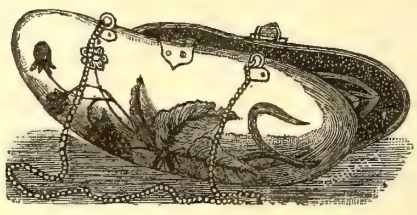

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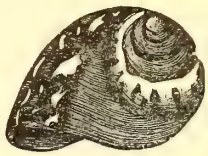

At a good Fair, with a suitable display you could sell from $10 to $100 per day, upon which there would be a GOOD BIG profit.

Now I will have lots of just such material on hand at Chautauqua, N. Y., that remains unsold. Rather than ship back home, will sell at very low rates. It may not be convenient for you to personally make your selections at either of the above places, but if you will send the amount you wish to invest and give me an inkling of about what you want, I will personally and judiciously make a selection that I will guarantee to give you big satisfaction in every particular and will make the prices to you lower than you could possibly duplicate elsewhere.

Remember I also carry a full line of Agate, Spar, Pyrites and Shell Jewelry, and Novelties. Write what you want and write quick as the season is over and I shall ship all unsold material home on September 15th.

Faithfully,

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NATURAL SCIENCE NEWS

VOL. I. No. 32. ALBION, N. Y., SEPTEMBER 7, 1895. Weekly, $1.00 a Year

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7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ, 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch.	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch. single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon, 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

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Attention Entomologists.

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The following butterflies put up in papers: Sapilio turnus, Sapilio troilus, Sapilio asterias, Sapilio ajax, Danais archippus, Colias philodice, Megan cæsonia, Eurema Mexicana.

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Write number and lowest price. Must be all A No. 1 specimens. All letters answered.

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523 Missouri Ave., East St. Louis, Ills.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

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WITH FULL DATA

Indigo Bunting	$ 20
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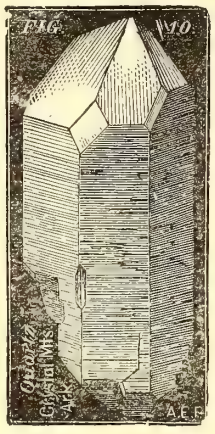

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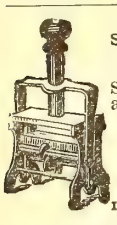

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The Biological Laboratory at Cold Spring Harbor, Long Island, N. Y.

The visitors who find their way into the bright, airy laboratory at Cold Spring Harbor, and are shewn about by Dr. Conn, the director, can hardly fail of getting a pleasant impression of the place. But the full charm and value of the work done here and the esprit de corps of instructors and students can only be realized by one who has studied here for a summer. And most fortunate of all the students who have ever attended the sessions of the school are those who have come this year, for the comforts of living have never before been so ample.

The foundation of the school was due primarily to the energy of Professor Franklin W. Hooper, secretary of the Brooklyn Institute, under the auspices of which it was established and is still maintained. Prominent on its board of managers from the first have been the Hon. Eugene G. Blackford, Mr. John D. Jones and Dr. O. L. Jones, and their generous gifts contributed largely to its original equipment.

For the first three summers the work was carried on at the Hatchery of the New York Fish Commission, but under much inconvenience; the necessarily limited number of students found lodgings where they could in the vicinity. But with a director so able and enthusiastic as Dr. H, W. Conn, of Wesleyan University, who took charge of the work the second summer, the school was bound to grow. In 1892, Mr. John D. Jones, already mentioned as among the first benefactors, was instrumental in the incorporation of an association called the Wawepax Society, and it is to this organization that the school owes its present ample quarters.

The laboratory which they built, after Dr. Conn's plans, was occupied last summer. This year they have put at the disposal of the students two comfortable buildings for dormitories. The one for ladies, which contains a dining room and reading room for the whole party, is especially pleasant. The buildings have been comfortably furnished by the Brooklyn Institute. Together with the lecture hall and Professor Conn's home, also given by the Wawepax Society, they form a picturesque group most conveniently situated with reference to each other.

Their location is delightful, for they stand on the hillside sloping to the head of Cold Spring Harbor, with wooded hills behind them and across the inlet, while in the distance stretches the Sound. New York is only thirty miles away, but the quiet of the place could hardly be more if we were in the heart of a desert.

Not only do we hear no market wagons, fog horns, trolley gongs or locomotive whistles, but not even a town clock disturbs us. The rest to tired nerves is almost equal in value to the benefit to be derived from the work; to some people it may mean quite as much.

The laboratory deserves fuller description. It is a pretty building, 72 feet long by 36 feet wide, finished exteriorly with shingles and interiorly with polished Georgia pine; a large brownstone fireplace partly fills one side of the main room. There are wide and high windows close together on every side, so that light and air are as abundant as possible.

Through the warm July days it has not been uncomfortable. Broad working tables fitted with drawers stand in range of the windows along the sides of the room in sufficient number to accomodate about forty students. There are six rooms fitted up for private laboratories for the professors and investigators.

Along the center of the main room aquaria are placed, through which fresh or sea water may be made to pass at will by turning a stopcock in the pipes above. Nothing in the life here is more entertaining than to watch that of the forms which for the time inhabit these aquaria. Today we may find the sides of one beset by star fishes, little and big, their ambulacral feet cling so fast that they will lose some rather than let go, if you attempt to move them. Below them hermit crabs are looking out from snail shells of varying sizes; a spider crab is dining off her own eggs, which she picks out with her long claws, while another is feasting upon a dead brother.

Scollops are popping up and down in jolly fashion, and great clumsy whelks have their broad yellow feet spread firmly upon the side of the aquarium where they are companions in exile.

In the next one, perhaps, there is a mass of squids' eggs in long, airy looking sacs, from which, one by one, minute independent squids now begin to swim into sight. Farther on we may see botanical specimens: delicate green or red algæa, and beside them in the next aquarium is a pond lily plant, root, leaves and fruit all in sight. Yesterday one aquarium was full of beautiful sponges, of which several varieties are found in the Sound. Tomorrow some of these forms that we have watched with so much interest will give place to others perhaps even more curious.

These specimens are, for the most part, brought in by dredging parties who go out in the naphtha launch belonging to the laboratory. It is run by a man who knows just where to "let down the net" for everything these waters yield. The boat is swift and fairly comfortable, and the excursions upon it are among the most delightful and profitable features of the life here.

The working day begins at nine o'clock in the morning, when Prof. Fernald, of the State College, Pennsylvania, gives a lecture in the course in zoology and Prof. Conn gives one to advanced students in his course in embryology. These last an hour, and then all pass to their places at the tables in the laboratory. Each student is provided with the instruments he needs for dissection, and with a microscope, if he has not brought his own. The morning is all too

short for the work that is to be done—the verification of the lectures or the study of some forms kindred to those presented by the instructors.

Let us go about the room during one of these experimental hours. We may find some students watching the development of newly fertilized eggs of oysters or squids. Here a young man is working out the nervous system of a species of worm—no easy task. We notice that a group is studying the lobster. They are at various stages of progress; one lady is making careful drawings of each of the appendages, while another is already tracing the digestive tract, and a third is finding the chain of nerve ganglia and their connections. The instructors are going about from place to place, adjusting a lens for one student, directing a cross section here, advising a better mode of procedure, helping or suggesting, as the case may be, but always attentive and unflagging in interest.

Many students are taking two courses, and in the afternoon two more lectures are given; one in the course in botany, by Prof. Johnson, of Michigan Universaty, the other by Prof. Conn, on bacteriology. The afternoon laboratory work is largely botanical. Here is an enthusiast who has scarcely been seen since the day of his arrival without a quantity of mushrooms about him; he draws them makes water color sketches of them, dries them, labels them, calls your attention to their beauties and peculiariites—does everything but eat them. Across the room we find several students are making slides. Their skill and success is evident if they invite you to look through their microscopes, for you find they have captured sea anemones and hydroids with tentacles spread, and the delicate forms have all the interest of a living specimen, save that they are motionless.

The students may be divided into three general classes: First, investigators who are working toward Ph. D. degrees in some college or university; second, teachers of science who have come to learn better methods, to get laboratory practice and to find out the latest opinions on unsettled questions in science; for example, whether both botanists and zoologists are still claiming volvex. The third class is composed of the youngest students, who are still undergraduates in college, or are supplementing the work which they have just completed there, preparatory to teaching or other practical science work. Most of these are from Wesleyan University.

But whatever the attainments or objects of all these students, there is no discounting the zeal and enthusiasm with which they study. The generous willingness to show what they find out so characteristic of the great scientists prevails here. Not a day passes but we see as interesting objects through other microscopes as our own.

The later parts of the day are devoted more or less to bathing, boating on the harbor or one of the ponds close by, or to rambles in the tempting woods. The wheelmen are among us, of course, and come into breakfast or dinner with cyclometer records that fill us with amazement, but which they assure us are quite within the bounds of moderation. Sometimes we have an evening of college songs, jolly, rollicking and care-dispelling as nothing else can be.

Once a week an evening lecture, semi-popular in its character, is given, and to this residents and summer dwellers or visitors at Cold Spring Harbor are invited. Prof. Conn opened the course with a suggestive lecture on "Evolution." Prof. Fernald followed with a charming account of "Three Months in the Bahamas."

This week we have had an illustrated lecture on our common wild flowers by Mr. Van Brunt, of New York. The beautiful colored photographs which he shows are his own and his wife's work, and very difficult to make, he says, "because the flowers are so full of life and move so much." But they have succeeded in getting pictures as poetic as they are true.

Reference has already been made to Prof. Conn's course to lectures on bacteriology. His investigations in this field, which have put him among the foremost bacteriologists, are carried on at the laboratory during the summer. Some ninety colonies of bacteria are under examination, the preparation of their culture media, their sterilization and that of the utensils used about them, the daily record of growth, multiplication, etc.— all this work is carried on under Prof. Conn's direction by his students and assistants. In time these ninety colonies will be differentiated and their value or deleterious effects will be tested.

Besides this work, the cultivation of Prof. Conn's famous "Bacillus Number 41" is carried on here, and from here it is mailed to creameries far and near where it has been adopted. The fact is that the application of this bacillus to butter making is revolutionizing the business, for not only does its introduction into the cream give a superior flavor to the butter, but it also makes it keep better. Already, some Iowa creameries have made between $20,000 and $30,000 by its use, for the reason that whereas they were formerly not able to get their butter into the seaboard markets soon enough to command the highest price, now they do, for they can sell their products for fresh butter.

This practical outcome of investigation with the bacteria which thrive in milk can hardly fail to act as a stimulus to some students at the laboratory to persevere in their patience-taxing study, and it is not unlikely that the world may some day see important results from their work. To the students least ambitious for renown or reward of any sort there is a stimulus in the thought of Mr. Benjamin Kidd that "in our time biology has been raised from a mere record of isolated facts to a majestic story of orderly progress."—*A. D., Cold Spring Harbor, L. I., in Scientific American.*

September Insects.

Few new insects make their appearance for the season during this month. Most of the species which abound in the early part of the month are the August forms, which live until they are killed by the frosts late in the month. From this cause there is towards the end of the month a very sensible diminution of the number of insects.

The early frosts warn these delicate creatures of approaching cold. Hence the whole insect population is busied late in the month in looking out snug winter quarters, or providing for the continuance of the species. Warned by the cool and frosty nights, multitudes of caterpillars prepare to spin their dense silken cocoons, which guard them against frost and cold. Such are the "Spinners," as the Germans call them, the Silk moths, of which the American Silk worm is a fair example. The last of September it spins its dense cocoon, in which it hibernates in the chrysalis state.

The larvæ of those moths, such as the Sphinges, or Hawk moths, which spin no cocoon, descend deep into the earth, where they transform into chrysalids and lie in deep earthen cocoons.

The wild bees may now be found frequenting flowers in considerable numbers. Both sexes of the Hnmble bee, the Leafcutter bee, and other smaller genera abound during the warm days.

One's attention during an unusually warm and pleasant day in this month is attracted by clouds of insects filling the air, especially towards sunset, when the slanting rays of the sun shine through the winged hosts. On careful investigation these insects will prove to be nearly all ants, and, perhaps, to belong to a single species. Looking about on the ground, an unusual activity will be noticed in the ant-hills. This is the swarming of the ants. The autumnal brood of females has appeared, and this is their marriage day.

The history of a *formicarium*, or ant's nest is as follows: The workers, only, hibernate, and are found early in the spring, taking care of the eggs and larvæ produced by the autumnal brood of females. In the course of the summer these eggs and larvæ arrive at maturity, and swarm on a hot sultry day, usually early in September. The females after their marriage flight, for the small diminutive males seek their company at this time, descend and enter the ground to lay their eggs for new colonies, or, as Westwood states, they are often seized by the workers and retained in the old colonies. Having no more inclination to fly, they pluck off their wings and may be seen running about wingless.

We have noticed that those females that do not return to the old nest found new ones. In Maine and Massachusetts we have for several successive years noticed the swarming of certain species of ants during an unusually warm and sultry day early in September.

The autumnal brood of Plaut lice now occur in great numbers on various plants. The last brood however, does not consist exclusively of males and females, for of some of the wingless individuals previously supposed to be perfect insects of both sexes, Dr. W. I. Burnett found that many were in reality of the ordinary gemmiparous form, such as those composing the early summer broods.

The White Pine Plant lice (*Lachnus strobi*) may be seen laying their long string of black oval eggs on the needles of the pine. They are accompanied by hosts of two-winged flies, Ichneumons, and in the night by many moths which feed on the Aphis-honey they secrete, and which drops upon the leaves beneath.—*From Packard's Insect Calendar.*

Culture and Biology.

One hears it said everywhere that Huxley was an example of the cultured man of science, and that such an instance is conspicuous by its rarity. Similarly it is frequently asserted that he was a man naturally inclined to letters and culture, who had become a man of science by the accident of events. We believe this to be a misapprehension. We do not dispute that Huxley was a man of unusual and commanding ability, who, in whatsoever environment he had chanced to live, would have been conspicuous among his fellows. But a considerable part of his culture arose from a necessary consequence of his scientific pursuits. Most scientific men, like most educated people, have an acquaintance with Latin and Greek. But it is also necessary that they should make themselves familiar with French and German. There are very few who do not in addition acquire a working knowledge of Italian: a large number can read Russian and a Scandinavian language in addition. We venture to think that among the educated classes generally, among parsons, journalists, lawyers, bankers, and even men of letters, there are very few possessed of this ordinary equipment of scientific men. Although the languages are acquired as a professional necessity, often as a distasteful task, there are few who confine their reading to foreign scientific memoirs. Speaking of our own acquaintances among men living in London occupied in one branch of science, we know one who has amused himself by translating into English verse German and Norwegian poetty; another Russian and French; another who is an authority upon Spanish dramatic literature; yet another whose daily companion is Machiavelli. And if it came to a contest in Continental light literature, we could make up a scientific eleven in whom we should have every confidence.—*Natural Science, (London)*

Apatura celtis (Bd-Lec.)

It was on a sultry day in the first part of August, when I strolled along a road leading through a fine spot of open forest in search of butterflies. It was a day which would not allow an entomologist to be lazy, for the woods were merely teeming with insect life. I had not walked very far along the road, when all at once something flew with a whirr past my face. Following the object as best I could with my eyes, I noticed it settle on an old burned tree, not fifteen yards from the place where I stood. Making my way through thorn bushes and creepers, cautiously, I came within ten feet of the tree, where I had seen it settle, when, whirr! it again brushed my face. Astonished at this queer action I stood perfectly still, thinking it must come back, in this I was not mistaken, for I had not long to wait, when not only one, but three settled on the tree. I now made the rest of the way without disturbing my game. Arriving there I noticed they were all to high for my net to reach them, thinking how would be the best way to get at them, I came to the conclusion, that it would be as well to chase them away, as to allow them to sit where they were, so taking a bit of bark from the tree I threw it at the lowest one, which was about fifteen feet from the ground. To my great surprise the butterfly was not frightened by the object, but to the contrary took after the same and returned to the tree after the piece of bark had reached the ground but this time setttled about two feet lower. As this was not low enough for me to make a strike I proceeded to throw another piece of bark up the tree, expecting the butterfly to alight still lower on its return, but this time all three took after it and promptly returned to the tree when the bark struck the ground. It was rather amusing play on their part. Repeating my action over and over again, I at last succeeded in getting one low enough to try a blow. A jump and a hit, were a moments work and he was my prisoner, and now occupies his well deserved place in my collection.

Now, I suppose the reader would like to know the name of my captive, it is a male of *Apatura celtis* (Bd Lec) which is here very rare.

HERMANN SCHWARZ,
St. Louis, Mo.

PENIKESE—A Reminiscence.

By One of its Pupils.

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them the more easily to remember them. It is as follows:

"Naushon, Nonamessett,
Uncatina, Weepecket;
Nashawena, Pesquinese,
Cutty Hunk, and Penikese."

Of course we cannot see all of these islands from our school; for, unless the day is unusually fine, we see very little excepting old ocean,—calm and glassy as a mirror, or tossing, tossing, tossing, all the day. Yet the air is always delightful, we have no smothering hot days, there are no mosquitos to keep one within doors of an evening, and, after a steady day's and evening's work—perfect rest!

Penikese, itself, is an hourglass-shaped little islet, and, in general appearance, though evidently not in size, "Gosnold's Flat" indeed, —with all its pokes and crinkles, and just as its owners, having grasped it in his hand, had tossed it into the broad, placid bossom of the bay. When I said that it was fourteen miles from land, I should have said, that it was fourteen miles from New Bedford,—for it is much nearer the little village of Quansett, directly northwest of it; and when I said, that it resembled a hat, I should rather have likened it to two hats placed side by side, the one smaller than the other, the smaller one lying nearest to the mouth of Buzzard Bay, and both running parallel to the shore. Little Gull Island is a minute near neighbor. Thus are we situated.

The beauty and attractions of Penikese Island are not, at first, apparent; yet no lover of nature can look upon green slopes, browned and whitened rocks, plains and hillocks, or the variety in contour upon our sea-girt, rocky island, without seeing in everything both beauty and attractions. To us, it is a Morgana's fairy isle,—with always something new to engage our attention, and wherein we would willingly remain our hundred years or more, and never grow old. We wandered about it. On every crag the sea swallows build their nests and in every bank the bank swallows dig their holes; wherein they lay their eggs and rear their young. The turnstone and the plover linger all day among their dear pebbles, and the sandpiper brings forth its nestlings amidst the sparce vegetation of the sanded beach above. Birds, birds, birds everywhere! The ground, the air, and the waters, abound with them; and the sound of their notes is incessant. The cricket and the grasshopper sing from their grassy coverts, and all nature smiles. These are some of the beauties and attractions of Penikese. Thus did we: I, all of us, find it on that first night, as we strolled here, there, everywhere, about our little pleasure-garden, until the darkness closed about us and the sea sang of rest.

Well do I remember that first night's stroll about the island. I was alone. No, not alone, for all Nature was with me, and I communed with her as with a fellow being, ever by my side listening to my youthful fancies, and sage like, propounding, at every step questions which I might never fully answer: Questions of the birds of the air or of their nest, eggs or young, close by; of the plants, lichens, and mosses of the rocks and ground about me; of the very sand, earth, rocks, boulders and ledges, at my feet; or of the fishes and marine life of great ocean—so bounteous, so mysterious—before me. There was no need for us to search long for "specimens;" for had our school lasted two years instead of two short months, I fancy that there still would remain much that was new to have been searched for, nay, to have been found. I would that I could recall all the weird fancies that came to my mind that first night, as I wandered amongst the darkening shadows of those rocky sentinals; as I peered over precipitous crags, or mounted to the top of some rocky height from which to view the fast dimming outlines of the lapping wavelets of the bay; or as, in some cosy corner, I reclined and listened to the murmur of the waves, and peering into the surrounding darkness, tried to distinguish something, where I knew there was nothing, in the vast beyond. Halcyon days, indeed! Halcyon summer evening, were they! Do you wonder that I look back upon them with pleasure?

As to our daily work, the routine for one day was much the same as for each successive day that we were upon the island, and we soon learned about what to expect. There were the breakfast horn, the breakfast and the lectures, which all or part might attend, occupying that part of the forenoon not devoted to exploring, collecting or dissecting; and then dinner time. After dinner a similar routine occupied the afternoon until tea time. Sometimes we had a lecture after dark, while we often dissected by candle light. Thus we were never idle, always busy, always learning! How softly and how pleasantly the time passed; and far into the night we remained rewriting our daily notes.

Professor Agassiz's own method of work was peculiar, and differed from that of any of the other professors, though many of them imitated him as closely as they were able. *He* never assumed superiority over his pupils; never attempted to annihilate them with his wisdom; but yet, *being* superior, he took the place of a brother rather than that of a teacher. As brother and teacher he was a living illustration of the truth of mottoes which, from time to time, he tried to impress upon his pupils. "If you wish to learn," he would say, " there must be no question of dicipline in the class room,"—and unruly members were dismissed at once and without mercy. And, again, "Never be afraid to say 'I do not know.'" He would give us an object, and oblige us to study that object alone for days, until we had ascertained the simple and yet plainly evident principals of classification involved in its form and proportions. Rarely would he tell us anything about any specimen which he had given us to examine; but would question us day by day until we had told him the history of the species, as we were able to discover it; or until we were obliged, from the mere fact of finding nothing else to say, to give him the very answer for which he had originally given us the specimen. Until we gave him this answer, we were subject to the closest and most continued scrutiny, whether the time were hours or days, made no difference to him. I once discovered, amongst the remnants of sand and debris in my collecting net, a most curiously speckled, shell-like or seed-like object, which, seeing Professor Agassiz near I hastened to show him. In the eagerness of the moment I asked him what it was. He looked at it intently for an instant. His face became long, then wore an anxious expression, as he took from his pocket a small lense and hastily began to examine the object with the utmost care. Gradually a smile spread over his features, then he fairly laugh-

[TO BE CONTINUED.]

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Taxidermist,
262 Main st., Worcester, Mass.

Florida Coast Shells
at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

We therefore make you the following offer: From now until October first we will fill all small orders for Sea Shells at very little more than the actual cost of packing and postage.

We will fill any order from ten cents to $2. and give you a finer and larger collection for the money than you ever had before.

We have large quantities of Florida coast and river shells, and we take this method of reducing our stock before the autumn collecting begins.

Unless otherwise ordered we will send a general assortment, and each purchaser, whether large or small, will receive some fine and rare shells.

Send registered letter, currency or stamps.
Address,

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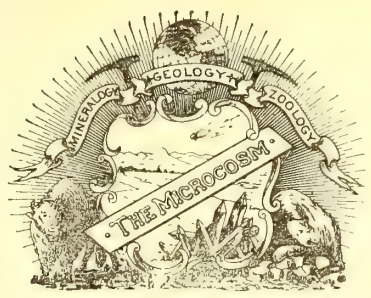

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Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

I have recently found some white **Chalcedony Geodes** in the Bad Lands, South Dakota that are different and more elegant than any I ever saw from any part of the world. They are rarities, in size from a hen's egg to a goose egg and lined with brilliant sparkling, frost-like white crystals; a few amethystine tinted and a few with transparent selenite, and others like snow. I will send them postpaid for 25, 35 and 50 cents. Small ones unopened 10 and 15 cents.

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Minerals from all parts of the world, especially the Black Hills and the west.

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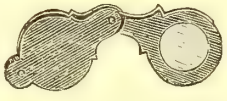

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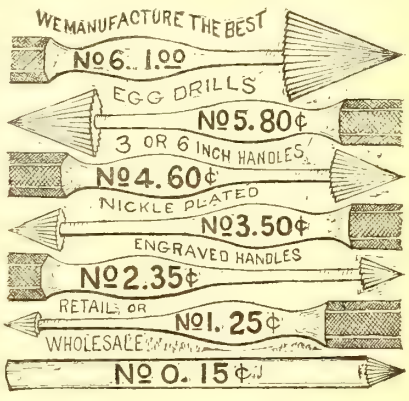

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when you can get *the best* of us at reasonable prices. We carry a full stock of all Instruments used by Naturalists or Collectors.

Send 2c Stamp for Catalogue.

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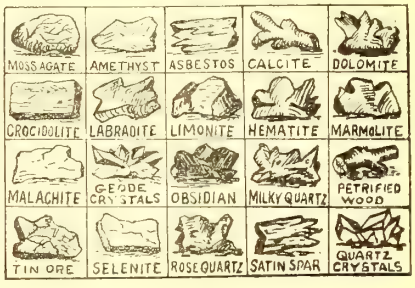
20 Showy Specimens, 35c postpaid.



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52 Specimens, all named, such as usually sell for 5 and 10 cents each. Will send prepaid for only $1.00.

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Manufacturer of Oval Convex Glass Wall Shades Patented.

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Natural Science News.

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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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For a short time only, we will sell *Buffalo Horns* nicely polished and mounted at from $1.50 to $3.00 per pair. Address, GILLBERT BROS. & GRIFFEN, Taxidermists, 1519 Leavenworth St., Omaha, Neb. 24-13t.

"Catch on" While You Can.

RARE SPECIES of North American Bird Skins a speciality, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Secure some of these *rare ones* while you have the chance. I will mention a few only: Franklin's and Richardson's Grouse, Ashy and Fork-tailed Petrels, Xantus, Marbled and Ancient Murrelets, FaralloneCormorants, Pacific Fulmars, Black-vented Shearwaters, Least, Crested and Parrot Auks, Aleutian and Prybilof Sandpipers, Rio Grande Turkeys, Aplomado Falcons, Arctic Horned Owls, Copper-tailed Trogons, Ivory-billed Woodpeckers, Carolina Paroquets, Great Black Swift, St. Lucas, Coues' and Sulphur-bellied, Flycatchers, Swainson's, Bachman's, Red-faced, Graces, Hermit, Golden-cheeked, Lucy's, Virginia's, Olive and Brasher's Warblers, Mirador Yellowthroat, Townsend's Juncos, White-naped Nuthatch, Anabel's Bluebirds, and thousands of others. Also many beautiful Tropical species. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country.

CHAS. K. WORTHEN,

NATURALIST, TAXIDERMIST AND DEALER,

Warsaw, Ill., U. S. A.

Established in 1873.

DEAR SIR:—

This is a missionary out for work—*your work.* It is as important for you to read as for us to send it, for everyone wants to know of a *good* place to get work done. Our business is PRINTING, and *good quick work* our business aim. As to price, that's important too, we're as low in that as good honest work can be done for. All we ask is a hint *how* to get your business, we'll do the rest.

Perhaps you want an estimate? We're already to figure; long distance telephone, mail or telegram reaches us; anyway to get there. If there's any business stirring we want to know it. You send an inquiry, we'll do the rest. What can we do for you?

Yours for business,

A. M. EDDY,

ALBION, N. Y.

NATURAL SCIENCE NEWS

VOL. I. No. 33. ALBION, N. Y., SEPTEMBER 14, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants." "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO EXCHANGE.— An International Type-Writer, almost new, cost $100, for best offer. A. M. EDDY, Albion, N. Y.

I HAVE FOR SALE Sea Shells by the doz., by the 100 or by the barrel, and cheaper than any one else sells them. Also have Curios and Bird Eggs of different kinds. Write and see. MISS IDA B. KIMBALL, New Cadiz P. O., Hillsboro Co., Fla.

FOR EXCHANGE.—Mounted specimens, eggs in sets and singles. All first-class with data, for sets with data. H. A. DUNN, Hoopeston, Ill.

WANTED.—Those having fossils named correctly, with geological formation, and locality, to send list with lowest cash price. W. A. STEARNS, Atlanta University, Atlanta, Ga.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

FOR SALE.—10 ga. shot gun, U. S. Arms Co. make, complete set reloading tools, 20 hole block, 3 joint, rod implements swab, scratch-brush, wiper and canvass carrying case leather bound for $15.00 cash, gun alone cost $25 00. J. MORRIS, 524 Kickapoo St., Leavenworth, Kans. 32-2t.

TO EXCHANGE.—Marine, Land and Freshwater shells, for others, especially foreign land shells. Send lists and receive mine. CHAS. S. HODGSON, Albion, Ills.

WANTED.—Curiosities, eggs, relics, stamps, fishing tackle, cigarette tickets and albums, books, scientific literature, anything useful, in exchange for 7000 cigarrete pictures, including birds, animals and fishes, colored. F. L. ENGLEBERT, Nicetown, Philadelphia, Pa.

CAMERA.—New 5x8 Blain Camera, double sliding front, swing back, carying case, Gray lens, 8 in. focus, rotating diaphragm, three double plate-holders, tripod, several boxes plates, developing trays, etc. Will sell complete outfit for best cash offer. H. T. VAN OSTRAND, Millbury, Mass.

WANTED.—Land and Freshwater Shells of North America, by W. G. Binney and Thos. Blard, in three parts. Offered shells or cash. CHAS. S. HODGSON, Albion, Ills.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

For a short time only, we will sell *Buffalo Horns* nicely polished and mounted at from $1.50 to $3.00 per pair. Address, GILLBERT BROS. & GRIFFEN, Taxidermists, 1519 Leavenworth St., Omaha, Neb. 24-13t.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

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A Cabinet Collection of Sea Shells, etc. Sold under a guarantee of being first-class Shells and perfect Specimens scientifically named.

Fulgur perversus, 4 inches long	20c
Cytherea gigantea, 3 "	15
Pyrula papyratia, 3 "	20
Oliva litterata, 2½ "	05
Haliotus, 3½ "	25
Strombus pugilis, 3½ "	10
Bulimulus, 2 "	10
Melonga corona, 2 "	15
6 other fancy shells, ½ to 2 "	20
Branch Coral, 3 "	10
Egg Case of Periwinkle, 10 "	10
Shark Egg, 3½ "	10
Saw Fish Saw, 8 "	30
Red, Gray, Black and Brown Banded Sea Beans, 1 to 2½ inches	20
	$2.20

Any of the above specimens sent on receipt of prices above mentioned, or the entire collection of 22 specimens sent prepaid for only $1 50.

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33-2t

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FOR THE

Young Collector!

Second-class eggs of desirable species at *very* low rates.

These eggs are not smashed ones but are either end-blown, chipped or cracked, or with large hole in side. Many are nearly 1st class, these I have marked * and priced accordingly. First column gives Standard rates on first-class specimens, second column *my* price on the specimen listed.

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Murre*	20	06
Great Black-backed Gull*	60	18
American Herring Gull*	20	05
Laughing Gull	20	05
Sooty Tern*	25	07
Black Tern	10	03
American Egret*	30	10
Snowy Heron*	15	05
Little Blue Heron*	12	04
Green Heron*	12	04
Black-crowned Night Heron*	12	05
American Woodcock*	1 00	35
Killdeer*	20	05
Wilson's Plover*	25	08
Bob-white*	10	03
Sooty Grouse*	85	20
Ruffed Grouse*	15	05
Virginia Rail*	20	05
Prairie Sharp-tailed Grouse	50	10
Sharp-shinned Hawk*	1 00	40
Red-shouldered Hawk	35	10
White-crowned Pigeon	1 00	20
Desert Sparrow Hawk*	25	10
Road-runner	25	06
Black-billed Cuckoo	15	03
Belted Kingfisher*	20	06
Chuck-wills-widow*	1 50	35
"		20
Nighthawk	40	10
Yellow-throated Vireo*	35	07
Cactus Wren	12	04
Verdin*	35	10
Bell's Vireo	15	03

Collection of 25 varities for only 50 cents.

Orders under 50 cents *must* contain 5 cents extra for postage.

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2.	Fulgur perversus, 3 to 8 inch	6
3.	Fasciolaria tulipa, 2 to 6 inch	8
4.	" distans, 1 to 3 inches	4
5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ, 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch, single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon, 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

J. C. Baker successor to **Baker & Hanson, Myers, Lee Co., Florida.**

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NEW YORK CENTRAL

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THE FOUR-TRACK TRUNK LINE.

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Stations.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....		8:00	10:30	2:20	5:35	10:00
Albion	7:00	9:10	11:35	3:25	6:50	11:06
Lockport	8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....	8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00

Florida Coast Shells

at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

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Unless otherwise ordered we will send a general assortment, and each purchaser, whether large or small, will receive some fine and rare shells.

Send registered letter, currency or stamps.
Address,

The Ebersold Family,

Oceanus, Brevard Co., Fla.

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FOR SALE BY

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HERMANN ROLLE,
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Natural Science News.

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FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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How One Spider Held Its Prey.

On the 23d day of August, 1895, while out on a botanical trip I was passing through a stump pasture, such as generally occurs during the transition of our land from forest to culivation, a medley of stumps, bushes and weeds with just enough grass for variety, when I noticed a large spider going through some peculiar motions. Upon stooping down for a nearer view I found it to be a large *Epeira diadema*, commonly called Geometric Spider from the perfectly regular construction of their webs. They are easily recognized by the large size and prominent yellow spotting.

At first I thought it to be fastening a ball of eggs into the web, but as I had never seen this spider secure its eggs in the web I stayed to watch developments. Soon I became aware, from the occasional convulsive movements of the mass, that there was something alive inside. The spider had both ends fastened securely to the web and getting squarely under had fastened the silken thread to one leg of a common honey bee *Apis mellifica*; then by holding fast with its hinder legs and treading swiftly on the bee with its forward pair, thereby turning the bee, much as horses turn a tread-power without changing position themselves, the spider wound the thread around the bee just as we would wind thread on a spool in a bobbin winder, i. e. by turning the spool and holding the thread tight. In a few minutes the bee was completely covered and only an occasional convulsive shiver of the silken ball showed that there was anything alive there. Then my spider left this one and went to another similar ball which I had not noticed before and commenced a vigorous attack with its mandibles soon eating through the silk and then into the contents only leaving when I poked it with a straw. Upon opening this second ball I found another honey bee partially eaten and evidently captured quite recently. I then opened the first ball but the bee had undoubtedly been bitten as well as entombed for it seemed to be going through a series of convulsions and to be incapable of any action. Is this a common practice with this spider or was my case an exceptional one? I have seen one web since with a wasp which might have been served the same way, though if so, the spider had eaten all of the case away.

ERNEST H. SHORT,
Gaines, N. Y.

Ants.

Dr. C. C. Abbot gives us the following account of the swarming of a species in New Jersey: "On the afternoon of Oct. 6th, at about 4 p. m., we were attracted to a part of the large yard surrounding our home, by a multitude of large sized insects that filled the air, and appeared to be of some unusual form of insect life, judging of them from a distance. On closer inspection these creatures proved to be a brood of red ants (*Formica*) that had just emerged from their underground home and were now for the first time using their delicate wings. The sky, at the time, was wholly overcast; the wind strong, southeast; thermometer 66 degrees Fahr. Taking a favorable position near the mass, as they slowly crawled from the ground, up the blades of grass and stems of clover and small weeds, we noted, first, that they seemed dazed, without any method in their movements, save an ill-defined impression that they must go somewhere. Again, they were pushed forward, usually by those coming after them, which seemed to add to their confusion. As a brood or colony of insects, their every movement indicated that they were wholly ill at ease.

"Once at the end of a blade of grass, they seemed even more puzzled as to what to do. If not followed by a fellow ant, as was usually the case, they would invariably fall down again to the earth, and sometimes repeat this movement until a new comer joined in the ascent, when the *uncertain* individual would be forced to use his wings. This flight would be inaugurated by a very rapid buzzing of the wings, as though to dry them, or prove their owner's power over them, but which it is difficult to say. After a short rest, the violent movement of the wings would recommence, and finally losing fear, as it were, the ant would let go his hold upon the blade of grass and rise slowly upwards. It could, in fact, scarcely be called flight. The steady vibration of the wings simply bore them upwards, ten, twenty or thirty feet, until they were caught by a breeze, or by the steadier wind that was moving at an elevation equal to the height of the surrounding pine and spruce trees. So far as we were able to discover, their wings were of the same use to them, in transporting them from their former home, that the 'wings' of many seeds are, in scattering them; both are wholly at the mercy of the winds.

"Mr. Bates, in describing the habits of the Sauba ants (*Œcodoma cephalotes*) says,* 'The successful *debut* of the winged males and females depends likewise on the workers. It is amusing to see the activity and excitement which reign in an ant's nest when the exodus of the winged individuals is taking place. The workers clear the roads of exit, and show the most lively interest in their departure, although it is highly improbable that any of them will return to the same colony. The swarming or exodus of the winged males and females of the Sauba ant takes place in January and February, that is, at the commencement of the rainy season. They come out in the evening in vast numbers, causing quite a commotion in the streets and lanes.' We have quoted this passage from Mr. Bates' fascinating book, because of the great similarity and dissimilarity in the movements of

* Naturalist on the River Amazons, vol. 1, p. 32.

the two species at this period of their existence. Remembering, at the time the above remarks concerning the South American species, we looked carefully for the workers, in this instance and failed to discover above half a dozen wingless ants above ground, and these were plodding about, very indifferent, as it appeared to us, to the fate or welfare of their winged brothers. And on digging down a few inches, we could find but comparatively few individuals in the nest, and could detect no movements on their parts that referred to the exodus of winged individuals, then going on.

"On the other hand, the time of day agrees with the remarks of Mr. Bates. When we first noticed them, about 4 p. m., they had probably just commenced their flight. It continued until nearly 7 p. m., or a considerable time after sundown. The next morning, there was not an individual, winged or wingless, to be seen above ground; the nest itself was comparatively empty; and what few occupants there were seemed to be in a semi-torpid condition. Were they simply resting after the fatigue and excitement of yesterday?

"It was not possible for us to calculate what proportion of these winged ants were carried by the wind too far to return to their old home; but certainly a large proportion were caught by the surrounding trees; and we found, on search, some of these crawling down the trunks of the trees, with their wings in a damaged condition. How near the trees, must be for them to reach their old home, we should like to learn; and what tells them, 'which road to take? Dr. Duncan states, * 'It was formerly supposed that the females which alighted at a great distance from their old nests returned again, but Huber, having great doubts upon this subject, found that some of them, after having left the males, fell on to the ground in out'of-the-way places, whence they could not possibly return to the original nest!' We unfortunately did not note the sex of those individuals that we intercepted in their return (?) trip; but we can not help expressing our belief that, at least in this case, there was scarcely an appreciable amount of 'returning' on the part of those whose exodus we have just described; although so many were caught by the nearer trees and shrubbery. Is it probable that these insects could find their way to a small underground nest, where there was no 'travel' in the vicinity, other than the steady departure of individuals, who, like themselves, were terribly bothered with the wings they were carrying about with them?" (*American Naturalist*).

* Transformations of Insects. p. 205.

Insects Which are Man's Friends.

The lady bug, so quaintly marked that it is hard to find two of them just alike, is one of the gardener's best friends, yet hundreds of them are killed because people, in their ignorance, don't know what a helper they have in this pretty, buxom little insect. A few days ago a writer in the New York Tribune visited a friend who has a garden full of all sorts of flowers, and back of these there is a kitchen garden, with rows of currants and raspberry bushes. The leaves of both these shrubs were covered with blight or lice that were as green as the leaves on which they lived and thrived. Hunting about the bushes were a number of lady bugs. The woman in her ignorance was killing these right and left, thinking they were doing all the damage, and when told they were her best friends was incredulous. A few minutes careful watching, however, showed the small bug busy eating the smaller green pest. Small yellow pyramids showed where she had laid her eggs, which in a day or two would hatch. The woman saw and believed, and in future the the lady bug has a sure refuge and a welcome in her patch of flowers and fruit.

Another insect that is forever being killed, owing to the ignorance of the general public is the dragon fly, also known as the needlecase. He is one of the most useful insects of this climate. In his larval state he subsists almost entirely on those small squirming threads which can be seen darting about in any still water, and which hatch out into the sweet singing mosquito. As soon as the dragon fly leaves his watery nursing ground, and, climbing some friendly reed, throws away the old shell and flies away, he is helping man again. His quarry now is the house fly. Not long ago the writer saw one of these insects knocked down in a veranda, where he had been doing yeoman's service, and the children and women seemed delighted, although they shrank back from the poor wounded dragon fly. They all thought he had an awful sting at the end of his long body—a cruel injustice. When the writer took the insect up there was general wonderment, which was increased when a captured fly was offered him and he ate it greedily. The boys of that household will never harm a dragon fly again.—*Scientific American.*

Fascination by Snakes.

No error is apparently more rooted in the human mind than that which attributes to snakes a peculiar power called "fascination," which they are believed to be capable of voluntarily exercising. By this power they are said to be able so to paralyze their victims that they are rendered utterly incapable of movement, and wait for the attack of a snake, or even go forward to meet it, in fear and trembling, but without any power of retaliation. Now any one who watches the behavior of small animals placed alive as food in the cages in which snakes are kept in captivity, in the hope of seeing this marvelous power in operation, will be greviously disappointed; chickens, rats, guinea pigs, rabbits, all move about with an utter absence of fear of snakes. It may be said that all these are more or less domesticated animals, and have no hereditary dread of their natural enemy; but wild rats, placed in the cage of their particular pursuer, the rat snake of India (*Zamenis muscosus*), exhibit an absense of fear.

How, then, is it possible to account for the existence of the belief in the possession by snakes of the so-called power of fascination? It may have arisen from several causes. An observer may come on the scene and find a number of birds mobbing a snake just as they will mob an owl or kite. The dashes of the birds toward the snake and their fluttering round it may easily be put down to the effect of the snake's glance, while they are, in reality, merely the attempts of the birds to drive off the intruder. A mother bird whose young are attacked will almost certainly behave in this way, and may herself fall a victim, not to the power of fascination in the snake, but to the force of her maternal feelings. Then again it has been noticed that a hen placed in a snake's cage will often go toward it and make a determined peck at

the snake's tongue. Dr. Stradling has also seen a frog doing the same thing.

Were this seen to occur in a wild bird, it might easily be put down to fascination. With regard to snakes that kill their prey by the injection of poison, it is even more easy to account for the appearance of the power, for they bite once and once only. The poison does not kill at once; the victim flutters on to a branch, it may be, or runs a short distance and stops, the snake watches it, the poison does its deadly work, and the bird falls. Any one who comes up not having seen the attack might in this way be readily deceived into imagining that it was the glance of the snake and not the poison that caused the victim to fall. It may be then the approach of an insectivorous bird or mammal who, taking the movements of the snake's tongue for those of a worm or insect, hopes to secure a meal. It may be the mobbing of the snake by the companions of a victim that has been seized, or of a mother whose nest has been robbed; it may be simply the effect of poison already injected before the observer has come upon the scene, or it may be simple curiosity.

These explanations should suffice to satisfy all those whose minds are not so filled with the love of mystery as to make them prefer to believe in the possession of this power, simply because it is mysterious, and therefore, to refuse a common sense explanation.

In ninety-nine cases out of a hundred one or other of the above causes has been at work. What, then of the hundredth case, and what about the fascination exercised on man, cases of which have undoubtedly been recorded? The explanation lies in the probability that it is a case of hypnotism: it may be said, however, this is giving up the whole argument and admitting that a snake can fascinate, only it is calling the power by another name and saying that it can hypnotise. But this is not so. The snake does not hypnotise, the person is self-mesmerized; the action is purely subjective. Every one knows the school boy trick of holding a cock with its beak pressed against a table and drawing a chalk line from the tip of the beak along the table. The bird will remain in the position it has been placed in, though perfectly free to move. Now the snake no more exercises the power voluntarily than does the chalk line; position and tactile impression here produce hypnotism, and visual impression can produce it likewise. It is an error to suppose will power has anything to do with the effect. The matter has been taken up scientifically by the medical profession, especially in France, and it has been found that the hypnotic state of sleep or trance, or whatever it may be termed, can be produced by looking fixedly at the operator or at a coin or at the tip of one's own nose; it is not necessary to go out into the question of how the result is brought about, but there is a physiological explanation. What happens then in the hundredth case is that the man or the animal may be self hipnotized by gazing fixedly at the snake, the subject, being thus thrown into a sort of a trance, making no attempt to move out of danger, unless roused by some exterior influence.

We may conclude, then, that the attribution to snakes of the power of fascination is due to faulty observation and the drawing of conclusions from incorrect premises.—*Harold S. Ferguson, F. L. S., in Science-Gossip.*

Ree Hills, S. D. Fossils.

Dr. Wm. M. Blackburn of Pierre University, S. D., and one of the leading geologist of the state, has been on a professional visit at Ree Hills, S. D., and various reports have been sent out regarding the finds made by him. The reports were contradictory. A reporter pointed out the following item in an exchange:

"Dr. Blackburn, president of Pierre University, while searching in the Ree Hills last week found a fine chalk ledge and a bed of interesting fossil fish, among them, one specimen of a hitherto unknown variety."

The doctor smiled and said: "That is one among several versions of a fossil fish story. It states both too much and too little. I have not claimed to be the discoverer of the chalk beds, nor of any commercial value in them, nor even of the fact that they contained the bones, fins, scales and prints (not petrifications) of fishes. The Magnesian chalk and some of its fossils were known by the early surveyors and settlers and mineral claims were filed upon the beds. Visitors made a slight examination of them and took away imperfect samples of fossil fishes and plants, but did not determine their species nor geological position.

"Seven or eight years ago Prof. J. C. Collester (now M. D.) and I went to those hills and put in some hard work excavating one of those chalk beds. Our motive was purely scientific. One result was a determination of the chalk as a deposit in a fresh water lake of the tertiary period, probably miocene and more recent than the cretaceous formation so common to our vast plains, if not later than the great lake in which the deposits of the White river bad lands were laid. The Ree lake may have been quite extended, and those layers of chalk are like fragments of a broken platter whose rim has been carried away. Those patches of chalk are evidently the remnants of a lake bottom left in the top of the high land that was not washed away in a great erosion which pared off the surface of the surrounding plain. Thus the chalk layers in the Ree Hills may be a means of measuring the amount of erosion in the plain since the lake was drained, leaving enough of its original bottom to make the upper part of the Ree Hills.

"Another result was the identification of the fossil fishes. My samples of them were not the first from that locality sent to the famous expert, Prof. E. D. Cope of Philadelphia, but they were more complete and there were more varieties of them. He found among them five species, of which three were general, all entirely new to science. They were lost fishes of paleontology, now taken on the hill tops.

"Yes, one was named by him after me, a sardine, *Sardinius Blackburnii.* I think that among those recently unearthed are samples of one or two species not found before.

"Traces of shells and plants were found in those chalk beds, in which further exploration should be made to learn more of their contents, their depth and the lateral extent of the ancient lake. No traces of its rim have yet been discovered."

Pierre, S. D., August 31.

Home-seekers excursions via Nickel Plate road, Sept. 9th and 23d. For all information, call on agents or address F. J. Moore, General Agent, 23 Exchange St., Buffalo, N. Y.

PENIKESE—A Reminiscence.

By One of its Pupils.

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ed as he closed the lense and replaced it in his pocket, and handed me back the specimen with the remark, "I will give you three weeks, Mr. ———, in which to find out what it is." He then proceeded with his own business as if nothing had happened. The following afternoon I accidently discovered that my specimen was the cornea of a crab's eye, which had accidently become detached from some specimen I had captured, and which had remained in the bottom of the net after its owner had been removed. "That man could get more out of me in three week's time, than anybody else I was ever under in three years," was the remark of one of his pupils to me. Why! For in seeking *one* point, he forced from you one hundred that you had not even suspected as existing before you began your search for it, all following each other as a natural sequence. He was a wonderful man, with a wonderful receptivity and extensive memory, and a wonderful capacity for teaching others; but words fail me in endeavoring to render a just estimate of his character.

The History of the School.

I have now introduced you to Penikese. Before unfolding the plan of our work there, bear with me a little, while I go back and rehearse somewhat of the history of the school thereon, since it is very properly a part of our little volume.

Before starting for Penikese Island, we had each of us received a variety of letters and circulars, both printed and written, relating to and descriptive of the manner in which the school was to be conducted, and the line of study to be pursued there. From the nature of the case, I judge that all of the scholars received similar information. I do not possess all of these valuable papers, I only wish that I did, but those which I have embrace the most important ones, and are fully sufficient for our present purpose. We will open the package and select those which seem most clearly to convey to us a knowledge of the intentions of the founders, and of Professor Agassiz, regarding both the school and its pupils.

The first letter, in order of time, appears to bear the stamp of Professor Agassiz's personal dictation and so I will quote it entirely:

Cambridge, Mass.,
May 18, 1873.

Dear Madam:*

Applications for admission to the Anderson School of Natural History are pouring in at an embarrassing rate. Among the latest applications there are some which seem to me to have higher claims than preceding ones. I therefore appeal to all who have already been admitted to state again how important it may be for themselves, or for the cause of education in general, that their individual case should be recognized, as fifty persons only can be accommodated in the laboratories of Penikese. To some, admission next year may perhaps be quite as useful as this year. Any failure to answer this request within a fortnight will be considered as a resignation.

Very truly yours,
L. Agassiz.

* This letter was addressed to a young man whose Christian name was so similar a name often applied to a lady, that the applicant was supposed to be such.

The above is Professor Agassiz's autograph. The circular to which it is appended was a written one, and was, I believe, the very first that was sent to the successful candidates. The letter of acceptance being (at least my own was), a personal one from the professor himself, such at least is my present impression. You may be quite sure that there was no "resignation" recorded to *my* name, and I answered the communication with so much dispatch, and withal so appealingly, that the return mail brought me another from Professor Agassiz himself, short and to the point, telling me to have no fear for or doubt of my acceptance as a scholar of the school at Penikese, "even though another questioning circular should reach you shortly."

During the early part of the winter of 1872, Professor Agassiz had contemplated opening a school of similar character to that which Penikese proved to be, on the Island of Nantucket or some point upon the mainland, perhaps at Wood's Hole. He had even printed a circular which advertised a "Course of Instruction in Natural History, to be delivered by the seaside, in Nantucket, during the summer months, chiefly designed for teachers who propose to introduce the Study into their Schools, and for Students preparing to become Teachers." He had selected his corps of instructors and lecturers, and assigned them the branches which he wished them and which he saw they were most fitted to teach: It contained the names of N. S. Shaler, Count L. F. de Pourtales, Dr. H. A. Hagen, A. S. Packard, F. W. Putnam, J. A. Allen, Spencer F. Baird, Theodore Lyman and many others. By the donation of Mr. Anderson, the location of the school was now definitely settled; and the work pushed forward with the greatest vigor. It was this same advertisement, in substance, that was sent to the pupils and friends of Penikese.

The work of preparing Penikese for the school to be held there, was commenced on the 20th of April, at which time a site for the buildings was selected and a general plan of operations arranged. In showing the dispatch with which Professor Agassiz consummated this—as in fact he did all of his plans—his grand, culminating life work, a few words from one of his reports says: "The plans were at once completed, and by the 16th of May the contract was made for the building. On the 28th of May the timber arrived from Maine in New Bedford. There the building was framed. On the 5th of June the first cargo reached Penikese, and the first building was raised on the 14th of June." We have seen, in a previous chapter, how the school began *upon the day on which it was advertised to begin, July 8.* Incredible dispatch! Provident accomplishment!

The same day that the timber for the buildings reached New Bedford, the following circular was issued:—

"Museum of Comparative Zoology,
"Cambridge, Mass., May 28, 1873.

"My Dear M.....

"In attempting to organize a School of Natural History upon an entirely new plan, I assume a grave responsibility which must, in a measure, be shared by those who may seek insruction there. To avoid disappointment, I feel it my duty to say what I propose to do, that those who may not like my course should be able in time to give up their intention of placing themselves under my direction. It is proper, also, to add, that the applications for admission are very nu-

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Hooded Warbler	45
Purple Grackle	25
Lapland Longspur	40

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For sale by

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September Egg List.

Everything listed will be sold at these prices until stock is exhausted.

	reg.	sp.
Pied-billed Grebe	$ 10	$ 04
American Herring Gull	20	09
" " " ¼ with data	60	29
Canvas-back Duck, with data	1 25	60
Spotted Sandpiper	15	06
Gambel's Partridge	25	15
Sooty Grouse	85	50
Road-runner	25	15
Yellow-billed Cuckoo	10	05
Arkansas Kingbird	06	03
Kingbird	03	01
Ash-throated Flycatcher	25	14
Phœbe	04	01
Yellow-headed Blackbird	03	02
Meadowlark	10	04
Orchard Oriole	06	02
Gray-tailed Cardinal	35	20
Painted Bunting	10	04
Sharpe's Seed-eater, with data	1 00	45
Scarlet Tanager	25	12
Summer Tanager	25	12
Barn Swallow	05	02
Pileolated Warbler	75	30
Mockingbird	05	02
Brown Thrasher	03	01
Carolina Wren	10	04
Brown-headed Nuthatch	25	11
Baird's Wren	25	11

FOREIGN.

Jay	10	05
Bullfinch	10	04
Redstart	10	04
Hedge Sparrow	10	04
Brambling	24	10
Siskin	1 00	30
Partridge	15	07
Barbary Partridge	35	15
Pheasant	25	10
Sparrow Hawk	30	14
Spotted Flycatcher	10	04
Rufous Warbler	25	12
Cettia Warbler	1 00	30
Orphean Warbler, with data	1 00	30
Grasshopper Warbler	75	20
Long-tailed Tit	1 00	30
Dartford Warbler, with data	75	25
Blue-throated Warbler, with data	75	25

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Fine Copper Pheasant, wings detached for mounting	$7 50	$8 00
Jay, very fine	1 50	75
Lapwing	1 00	50
Nightingale	75	40
Wryneck	50	30
Robin	35	20
Bird of Paradise, *very rare* and extremely beautiful species	15 00	10 00
Copper Pheasant, mounted on plush, in gilded frame 44x19 in. Bird 42 in. long	25 00	12 00

Everything sent prepaid at prices named if you order 50c worth. Under 50c, *must* contain 5c additional for postage.
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Mica Crystals.

A new thing of great interest to mineral collectors. Groups of brilliant Hexagonal Crystals, emerald green in color and many of them transparent.

This is the only deposit of this mineral we have ever found, and the supply is limited.

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Natural Science News.

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All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

R-I-P-A-N-S

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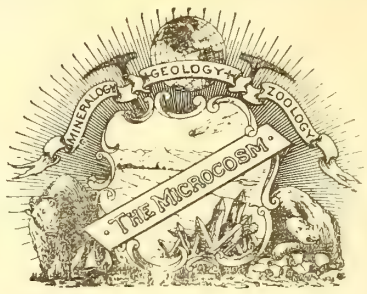

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Best books with fine illustrations on Insect Life published for the price.

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It contains an account of the many Minerals received by us during the past year of which the following are examples: Quartzes, Leadhillite, Galena and Calcite, Chalcopyrite, Amethystine Iceland Spar, Azurite, Diaspore, Hanksite, Thenardite, Shpærostilbite, Chabazite Thomsonite, Opal, Sulphur, Celesite, Rutilated Quartz, Monticellite, Brookite, Rutile, and Dysanalite.

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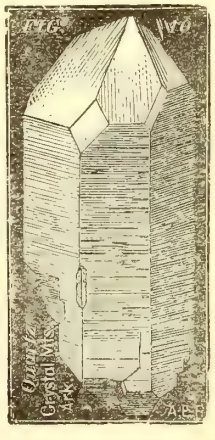

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NATURAL SCIENCE NEWS

VOL. I. No. 34. ALBION, N. Y., SEPTEMBER 21, 1895. Weekly, $1.00 a Year

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WANTED.—Those having fossils named correctly, with geological formation, and locality, to send list with lowest cash price. W. A. STEARNS, Atlanta University, Atlanta, Ga.

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TO EXCHANGE.—Marine, Land and Freshwater shells for others, especially foreign land shells. Send lists and receive mine. CHAS. S. HODGSON, Albion, Ills.

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6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ, 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2¼ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch, single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon, 18 inch to 2 feet	20
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39	Florida air plants	10
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		$2 15

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A new thing of great interest to mineral collectors. Groups of brilliant Hexagonal Crystals, emerald green in color and many of them transparent.

This is the only deposit of this mineral we have ever found, and the supply is limited.

Prices for Groups, 10c to $1.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:00
Niagara Falls.	6:35	8:05	11:18	1:40			6:00
Susp. Bridge .	6:45	8:10	11:25	1:48			6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55		6:45
Albion..... .....6:50	8:15		1:00	3:25	6:45		7:50
Rochester.....8:00	9:20		2:05	4:35			9:00

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at less than cost!

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Send registered letter, currency or stamps.
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The Ebersold Family,

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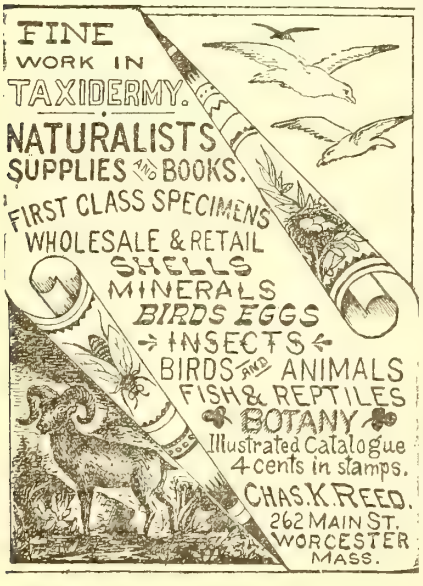

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Minerals from all parts of the world, especially the Black Hills and the west.

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Shells, Indian Photos of a hundred leading chiefs.

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Large Spreading Adders	1 50
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Green Snake	50
Small Spreading Adders	50
Turtles, small, (several species)	25
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The purchaser to pay express charges.

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Bulimulus, 2	"	10
Melonga corona, 2	"	15
6 other fancy shells, ½ to 2	"	20
Branch Coral, 3	"	10
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Shark Egg, 3½	"	10
Saw Fish Saw, 8	"	30
Red, Gray, Black and Brown Banded Sea Beans, 1 to 2¼ inches		20

$2.20

Any of the above specimens sent on receipt of prices above mentioned, or the entire collection of 22 specimens sent prepaid for only $1.50.

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Best books with fine illustrations on Insect Life published for the price.

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Price List, Postage Free.

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Natural Science News.

VOL. I ALBION, N. Y., SEPTEMBER 21, 1895. No. 34

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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Propagation of Alligators.

The attention of the United States Fish Commission has recently been called to a new and remarkable industry, that of the artificial propagation of alligators for supplying the trade in Florida curiosities. The incubator system employed is quite simple. The eggs, are placed in boxes of sand and covered up. The boxes are exposed on a roof to the torrid rays of a tropical sun, and in a few days the young reptiles are hatched.

It appears that a spccies of true crocodile is found in Southern Florida on both coasts. It is hardly distinguishable from the alligator except by the shape of its head, though it grows larger and attains a length of eighteen feet.

Dr. Hugh M. Smith, of the Fish Commission, says that young crocodiles are hatched for market in the same fashion. The mother crocodile lays her eggs in the sand like a turtle, and simply covers them over. Somewhat different is the practice of the maternal alligator, which in April or May seeks a sheltered spot on a bank and there builds a small mound. The foundation of the mound is of mud and grass and on this she lays some eggs. She covers the eggs with another stratum of grass and mud, upon which she deposits some more eggs. Thus she proceeds until she has laid from 100 to 200 eggs.

The eggs, in the course of time, are hatched by the sun, assisted by the heat which the decomposition of the vegetable material generates. As soon as they have "chipped the shell" the baby alligators are led to the water by the mother, who provides them with food which she disgorges, showing much anxiety for their safety. At this early period of their existence they are exposed to many dangers, being a favorite prey of fishes and turtles. Alligators' eggs, by the way, are sometimes eaten by the Florida crackers. The robbing of the nests for market is helping to hasten the inevitable destruction of the alligator fishery, which has been an important and profitable industry in Florida. Facts recently gathered by the Fish Commission show that the reptiles cannot long escape practical extermination. Already they are becoming scarce, and the price of hides has gone up,

It is estimated that 2,500,000 alligators were killed in Florida between 1880 and 1894.

In 1890 about 250 pounds of alligator teeth were sold, hunters receiving from $1 to $2 a pound for them. They are removed by burying the heads and rotting out the teeth. Of the best teeth about seventy make a pound. The stuffing of alligators and the polishing of the teeth give employment to forty persons. Unfortunately, alligators grow very slowly. At fifteen years of age they are only two feet long. A twelve-footer may be supposed reasonably to be 75 years old. It is believed that they grow as long as they live, and probably they live longer than any other animal.---*Scientific American.*

Influence of Climate on Foliage.

Professor Strasburger is one of those eminent European botanists to whom students in plant life have looked up to as among their greatest teachers, and it is therefore with some surprise that Americans read a recent paper of his in connection with the influence of climate on the structure of leaves. He takes for an illustration the European beech. He says that when the beech produces its leaves in the deep shade of the forest, they are larger and finer than the leaves of the same tree exposed to full sunlight, and from this he deduces a general principle that abundance of sunlight to a dry atmosphere is the reason why leaves are thick and small. Yet it has been for over a quarter of a century placed on record, and admitted as an undeniable fact, that in the case of allied species of European and American trees, the leaves of the American are larger and thinner than those of the European. The American Linden has larger and thinner leaves than the European Linden. So has the American Sweet Chestnut, American Oak, American Ash, American Buttonwood or Sycamore, and in fact, all American trees that have close European allies. And yet no one will contend for a moment that the English climate is dryer, or that there is more light or more long continued sunlight in England than America. It is unfortunate when great authorities like Strasburger, attempt to found great scientific truths on such slender materials.—*Meehan's Monthly for September.*

Fish as Athletes.

Chas H. Worthington of San Jose relates a remarkable story of fish flouncing about playfully on a dry, sandy bank several feet from the water. This came under his own observation while he and others were camping at the head of Cache creek, Lake county, recently. Mr. Worthington's attention was first called to it by his son and after watching closely a few moments he noticed a few of the vivacious finny spring out of the water and onto the sand, and by twisting their bodies and performing various other acrobatic tricks, their locomotion along the bank was neatly facilitated. After they had congregated on the sand the scaly inhabitants of the water began to sportively flounce about, continuing their fun for several seconds. Then somewhat fatigued by their atmospheric recreation they plunged back into the creek. This performance was repeated at brief intervals and the fish seemed to enjoy it hugely. Mr. Worthington is a man whose veracity cannot be questioned and though the story seems incredible it is not an absurdity by any means.—*Healdsburg (Calif.) Tribune.*

The Gulf Weed.

The remarkable algæ known as gulf weed (*Sargassum bacciferum*) was first discovered by Columbus, and has for ages been floating up and down in midocean, occupying the position still that it did in the times of the earliest navigators. It is never fruitful except when attached to land within the area of the Sargasso Sea and the Gulf Stream, as at the Bermudas, yet it flourishes with vigor. The present geographical distribution is very strange. The Sargasso plants are about the oldest of seaweeds, and seaweeds were among the first productions of vegetable life. At present sargassum occurs in vast floating beds in the warm waters of all the oceans, and as the marine connections between the different localities are now closed to intercommunication by a barrier of icy water which it is impossible for the plant to pass, the distribution must have been effected previous to the beginning of the glacial period, which Mr. Croll puts at over 200,000 years ago. It is, therefore, thought probable that the Indian Ocean was the primary habitat of the gulf weed, and that the plant is a survival, in health and vigor, of the marine vegetation of a period as remote at least as the Miocene epoch. This theory of the intercommunication of oceans in equatorial latitudes during the Miocene period agrees with the views expressed by Mr. Alexander Agassiz.—*Scientific American.*

Origin of Phosphate Beds.

Professor E. T. Cox, formerly State Geologist of Indiana, and who for many years past has made a study of the phosphate beds of Florida, shows conclusively the fallacy of the prevailing belief that they have resulted from shell deposits. He says that with the evidence before us, of causes now in action that produced the immense deposits of guano on the islands off the rainless coast of Chili and Peru, the islands of the Caribbean Sea, and elsewhere where the droppings of numberless birds are converted into guano, both pulverulent and rock-guano, it is not necessary to construct strange theories to account for the phosphate-deposits in Florida. Unlike Peru, the climate here was humid, and washed out of the guano the soluble salts, leaving the insoluble phosphate of lime.

The isolation of the deposits, their occurrence in detached pockets of greater or less extent, as well as the conformability of the phosphate-rock to the very jagged surface of the limestone on which it rests, all point to the bird origin as guano.—*Mechans' Monthly for August.*

Hints About Making an Aquarium.

One of the most fascinating means of studying the life of the ponds and brooks is by keeping an aquarium. If you have not looked into the subject, you would be surprised to see how many and what curious animals and plants will inhabit even a small aquarium. Though one may not care for scientific study, he can hardly fail to be interested in watching them, and he must thereby learn much of their life, with its droll and its tragic side.

In this paper I shall try to describe the preparation and care of a small fresh water aquarium. Of course the first thing is to procure the tank which may be of almost any shape that pleases you. One with curved surfaces should be avoided, as the curved glass will distort everything inside. The most desirable shape as that of a rectangular box about twice as long as wide. One twelve by twenty-four inches is convenient, though one a little larger is preferable. The glass should be clear and free from irregularities and bubbles, with the bottom and corner posts of iron. Care should be taken that no metal surface is exposed to the water. The bottom and posts may be painted or covered with cement.

In preparing the aquarium for occupation, the bottom should first be covered to the depth of an inch or two with fine sand. This should be previously cleansed by washing it several times in clean water, and pouring off the dirty water each time. Spread the clean sand evenly on the bottom and cover it by a layer of rather fine gravel. The pebbles should be about the size of peas. No earth should be put in, as it is continually being stirred up, rendering the water muddy. If the tank is large enough, some small stones may be loosely piled up in the center or at one side, furnishing a shelter for the fish. For filling the aquarium, well water is just as good as spring or brook water, except possibly for the fact that the latter usually contains more plant and animal life.

We come now to the point of stocking our aquarium. What shall we put into it? In the first place, we must have some plants. For an aquarium thirty inches long a clump of "arrow head" (*sagittaria*) will not be too large. This is one of our native aquatics which is common in almost every swamp. It grows in shallow water in clumps much like those of the calla. As in that, the leaves, raised above the surface of the water, are shaped like an arrow head. During the summer it sends up a slender stalk, bearing a loose cluster of very fragile white flowers. In planting sagittaria or any similar plant one should make a place for it in the sand, spread its roots out and cover them over with sand and gravel. It seems to thrive under these conditions.

A cultivated plant of great value for aquaria, because of its hardiness and its vigorous growth, is that known as "parrot's feather." This grows without rooting firmly in the sand, and most of the leaves are borne on short branches, which rise above the water. The leaves are very finely divided, bearing some resemblance to a feather, and suggesting the common name. This can probably be procured from the more prominent florists.

Floating plants are useful and pretty in an aquarium. Of these one of the best is the "bladderwort" (*utricularia*). This can probably be found in most parts of the country. The largest species, such as *Utricularia vulgaris* are the best. They may be distinguished by their finely divided threadlike leaves, and by the numerous bladders which they bear. These bladders are themselves of very great interest, for each is a little trap by means of which the plant catches various minute water animals. At the throat of the bladder there is a tiny trap-door opening inward, and the inquisitive intruder finds that, once inside, there is no escape. The bladders also serve to float the plant. All the leaves are submerged. The flower stalk rises above the surface of the water and bears a raceme of pretty flowers, bright yellow in most of our species, rich purple in one or two.

The "water milfoil" (*myriophyllum*) is another good plant for the aquarium. It looks much like a vigorous *utricularia* without the

bladders. Its leaves are much coarser and stiffer than those of *utricularia* and stand out on all sides of the stems, hardly collapsing when they are removed from the water. The flowers are inconspicuous, and are borne singly in the axils of the leaves. Such plants as these furnish shelter for fish, and supply food for them in the minute animals and plants which swarm among their branches.

One of the oddities of plant life which is interesting for an aquarium is "duckweed" (*lemna*). It is often seen absolutely covering the surface of small ponds, giving them a bright, green color. The plant has no stem or leaves, but consists simply of an oval disc from which may grow two or three others as buds. They float flat on the water, and from the underside there hang down several slender, straight, unbranched roots. These furnish a refuge for many minute animals and plants. The flowers of duckweed are very minute and rise from the edge of the disc.

Having our aquarium supplied with plants we must decide what and how many animals to put in it. This must depend somewhat on the purpose for which the aquarium is prepared. If for scientific study we want, of course, those animals which we propose to study. If the purpose is simply pleasure, nothing is more satisfactory than fish. In choosing these one must be guided by his own preference and by his surroundings. To my own mind some of our native fish are much more interesting than gold fish. The little sticklebacks make very attractive inhabitants, but probably all could not procure them. Perhaps the most satisfactory ones will be some of the small fish called sunfish, roach, pumpkinseeds, and by various other names. These are beautifully colored; they are easily kept and very active. There is one drawback to their use —they are very pugnacious, and are likely to attack any other fish put in with them. A single sunfish has been known to eat a hundred trout fry in one day. Of course this was under exceptional circumstances, but it serves to show their character. If you put other fish in with your sunfish, be sure that they are able to take care of themselves.

One must be very careful not to over-stock his aquarium. For one 16 by 30 inches, two or three sunfish three inches long will be plenty. If more are put in, they are likely to die, unless the water is frequently changed. If one lives where they abound, a very small crayfish or two will be an interesting addition to your aquarium. I have kept one for more than a year. A crayfish will burrow in the sand under the stones, and will not always be willing to show itself to the public; but when it does appear its actions are interesting. If you are not familiar with its habits, you will be surprised some day to find the empty shell lying on the bottom, looking as if its owner had been killed. You will doubtless find the latter under some stone waiting for his new shell to harden. He has simply been moulting. The most amusing occupants of my aquarium were a couple of tiny snapping turtles, with shells not much more than an inch long. Their queer doings were described in this paper some years ago. They would probably not molest fair-sized sunfish, but small or weak fish would not be safe with them. Of course, if turtles form a part of the "happy family," there should be a bit of rock projecting above the surface, on which they may rest.

To manage an aquarium successfully, one must get the right proportion between the plant and the animal life. This can be determined only by experiment. If the fish act as if in want of air, gasping at the surface of the water or turning on their backs, it is certain that you have too many of them in the tank. If, on the other hand, the plants seem likely to fill up the tank, growing too vigorously, more animals of some sort should be added. Pond snails are excellent scavengers, and are said to be especially useful in cleaning off the scum which is sometimes caused by the growth of minute plants on the glass. One objection which I have to snails is that they are extremely vigorous, and, if numerous, will eat off the green parts of the water plants. They multiply very rapidly, and one soon finds the glass coated with a slimy mass of eggs, giving place in a few days to young snails which eat every plant within reach. If you use snails as scavengers, do not let them get too numerous. Of course, in addition to the animals put intentionally into the aquarium, one will find many small ones introduced with the plants or in the water.

The aquarium should be set where it will receive good light, but not stand long in the direct sunlight. The water will not need changing unless you have too many animals or not enough plants in the tank. The reason is this: Of course we know that fish, like other aquatic animals, breathe the air contained in the water, using the *oxygen* and giving back into the water *carbon dioxide*. The reason why the fish sometimes come to the surface and appear distressed is, that their supply of oxygen has failed, and they are unable to breathe. If we add fresh water we renew the supply. Now the advantage of having plants in the water is this: Green plants use up as food *carbon dioxide*, when acted on by sunlight. They combine this with water, and from these substances manufacture starch, giving off the extra *oxygen* into the water. One can prove this for himself by putting some water plant in a jar and placing over it an inverted funnel so that the whole is submerged. Then fill a glass tube (closed at one end) with water; place the thumb over the open end and, inverting it, slip it down over the neck of the funnel in such a way that it remains full of water. If the whole jar be placed in the sunlight, bubbles of gas will begin to rise rapidly into the tube, and finally it will be filled with gas. By putting a glowing match into this we can prove that it is oxygen, the match blazing up at once. It is evident, then, that the growth of plants in the water continually replenishes the supply of oxygen for the animals, at the same time using up the carbon dioxide. If the proper balance is preserved between animals and plants, the water will remain clear and both will thrive. Of course the loss of water by evaporation should be made good.

As to the question of feeding fish, opinions may differ. With plenty of plants growing in the aquarium, fish ought to be able to find enough food for themselves. If it is necessary to feed them at all, a very small amount of bread or cake crumbs will suffice, or better still a few scrapings of raw meat. Care should be taken to supply *very* little food, for if any is left uneaten it will foul the water. Ordinarily it will hardly be necessary to feed at all unless the fish seem especially hungry. The other smaller inhabitants of the aquarium will be able to take care of themselves.—*The Cultivator and Country Gentleman.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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merous, and exceed so much the accommodations of the place as to embarass me greatly. I must make hard work a condition of a continuous connection with the School, and I desire particularly to impress it upon the applicants for admission, that Penikese Island is not to be regarded as a place of summer resort for relaxation. I do not propose to give much instruction in matters which may be learned in books; nor do I wish books to be read during the summer session of the School on Penikese Island. I want, on the contrary, to prepare those we shall attend to *observe for themselves*, that they may hereafter be able to make the most of their opportunities for study in nature, in whatever part of the counfry they may reside, as there are hardly two adjoining school-districts in which the same objects may be collected for examination.

"It will no doubt appear, to many, a wearisome process to sit for hours before a specimen without any but a very general direction what to do with it. I would, therefore, advise all those who wish only to be taught Natural History in the way in which it is generally taught, by recitations, to give up their intention of joining the Anderson School.

"My plan will further imply the obligation, on the part of all present, of making special collections to carry home and use as a basis for the teaching others, in the same way, I propose to teach myself, with the assistance of many of my scientific friends.

"My object in adopting this course is, not only to give what I consider to be the best instructions, but also to show how teaching should be conducted by competent teachers.

"I wish it were possible for me to state at this early day what the expenses for board are liable to be for the season. As there is no public house upon the Island, everything must be provided for by private arrangement. I can only say that it will be furnished at cost, at the most economic rate; and that no tuition fee is to be charged.

"The course will probably open in the first days of July.

"Yours Very Truly,
L. Agassiz.

"Should you be prevented from attending please inform me early, as there are many who wait anxiously to fill vacancies. L. A."

This was, doubtless, the "questioning circular" before referred to, and, after receiving it, I was in a continual state of nervous excitement. Fears that the School would begin without my receiving further notification of it, of a thousand different things, possessed me; but I occupied the time as fully and as profitably so I was able, and gave old bachelor tea and coffee parties, in my room, daily and nightly, to all my old chums and their friends, as often as they could be induced to call upon me, in prospect of a speedy departure. It was not until nearly a month's time had elapsed, that I heard again from Penikese; but, when I did, it was in the shape of a final circular which gave all necessary information relating to the subject. It read as follows:

"Anderson School of Natural History.

"Cambridge, Mass., June 26, 1873.

"M.....

"I have at last decided to open the Anderson School of Natural History, on Penikese Island, at 12 o'clock, on the 8th of July next. The place is fourteen miles distant from New Bedford, Mass., and the city is easily accessible by railroad from Boston or from Providence, R. I. Persons coming to join the School from a distance would do well to arrange their journey so that they may reach New Bedford Monday evening, the 7th of July. This place affords good accommodations at the Parker House, where information concerning the boat to the island may be had. A few miles to the east of New Bebford is a watering place, Mattapoisett, where those reaching this vicinity a few days in advance may pass some time pleasantly.

"It is necessary that all should remember that Penikese Island affords no accommodation for strangers, and that therefore nobody can be invited to visit the Island during the session of the School. I have provided rooms and board for all, but made no allowance for supernumaries. As it is, I am not yet able to say what the expenses will be. All the arrangements have been made upon the most economical plan. The dormitories have been built at the expense of the School, and no rent will be charged, beyond a percentage on the bedroom furniture. The board will be charged at cost. A caterer has been engaged who will provide for the table and keep the rooms in order, superintend the washing, etc., and the expense thus incurred will determine the charges.

"It has already been stated that the instruction will be free. Aquariums have been provided which will take the place of books; and cans and other necessaries for the preservation of specimens will be ordered, and may be bought at cost. The preparation for these collections will not lead to any considerable expenditure, and is optional.

"Very truly yours.
"L. Agassiz.

"P. S.—Should you be prevented from coming, give me early notice as there are many waiting for a vacancy."

I regret, very much, that I am unable to discover among my papers the circular containing the course of instruction, and the names of the instructors, as laid out for this *first* year of the Penikese Island School. It would be both valuable and interesting. I prefer giving such papers *entire*, when possible; but as in this case it is impossible, I will describe to you briefly our course.

The programme for Penikese (or "Pune," as it is sometimes called) hardly differed from that which had been previously prepared for the Nantucket School. The former certainly possessed many advantages over the latter,—yet the main purpose and aim of the "course" remained unchanged.

Throughout the Summer we had daily lectures from Professor Agassiz—upon Natural History, and upon Geology; and his talks on the glaciers and the glacial theory, of which he may now justly be called the father, were full and very interesting. Then a generous citizen of Boston donated to the School a fine yacht, for sailing and for dredging purposes,—and the "Sprite," under the direction of that able Naturalist and seaman, Count Pourtales, carried dredging parties almost daily, or as often as the weather would allow, throughout the season. What material was thus presented for study! What splendid collections we made! How hard we worked to please Professor Agassiz!

Our lectures, the more important ones at least; were given in the early and in the latter part of the day.

(*To be continued.*)

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Deep Sea Hedgehog, *Phormosoma placenta*, very rare	25, 50
King of the Echinoderms, *Metalia pectoralis*	2 00
Spider Starfish, *Ophiopholis aculeata*	25
Medusa's Head, *Astrophyton Agassizii*	25, 50, 1.00, 2 00, 3 00
Deep Sea Starfish, *Archaster Agassizii*	50
Atlantic Starfish, *Asterias vulgaris*	25, 35, 50
Black Starfish, *Echinaster sentus*	35
California Starfish, *Asterias ochracea*	25, 50
Compass Starfish, *Heliaster Kubingii*	50
Armor Starfish, *Nidorella armata*	50

SHOWY SHELLS.

White Murex	$ 25
Rose Murex	25
Pink Murex	35
Snipe billed Murex	50
African Murex	50
Thorny Woodcock Murex (*fernispina*)	35
Melon Shell	35
Foxhead	25
Marlinspike	25
Harp	35
Marbled Cone	25, 50
Dotted Cone	15, 25
Winged Stromb	25
Banded Stromb	25
Silver-lip	15
Spider Shell	35
Tiger Cowry	25
Blued Cowry	25
Panther Cowry	25
Egg Shell	25
Cameo	25
Apple Shell	50
Screw	25
Bleeding-tooth, extra fine	10
Pearl Trochus	25
Turk's Cap	25
Magpie	35
" natural	25
White Ear	35
Green Ear	35
East India Clam	25
Heart Shell	25
Venus Shell	25
Thorny Oyster, (Spondylus)	2 00
Cassidaria	25
Gold Mouth, natural	25
Japanese Eburna	25

BIRD SKINS.

Snowflake	25
Scarlet Tanager	60
Blue-winged Yellow Warbler	35
Yellow-breasted Chat	40
California Patridge	1 00
Rose-breasted Grosbeak	50
Wren-Tit	75
Indigo Bird	25

SCIENTIFIC SHELLS.

Murex saleanus	$ 10
Trigonia pectinata, 1 valve	15
Helix fideles	15
Arca ponderosa	15
Cuma kiosquiformis	20
Trochus pellis-serpentis	15
Achatinella perversa	10
" uniplicata	10
" spirizona	10
" olivacea	10
Bulimus Bahamaensis	15
Pithea pyramidata	10
Partula gibba	10
Fissurella Barbadensiis	10
Sycotypus paparatia	25
Cypræa erosa	15
" caurica	15
" Isabella	15
" annulus	10
" moneta	10
" carneola	15
" vittellus	25
Ovulum secale, on twig of Pterogorgia	20
Helix Zebuensis	20
" muscarum	10
Nanina hepatica	20
" Humphreysiana	30
Orthalicus fasciata	15
" undatum	15
Ancillaria glabrata	25
Monoceras muricatum	25

Natural Science News.

ADVERTISING RATES.

Only 5c per norpareil line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

100 lines	4½c	per line.
200 "	4	"
300 "	3½	"
500 "	3	"
1000 "	2½	"
2000 "	2	"

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A little two-line ad. would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

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A 3¼ inch ad. run one year would use 2,028 lines and would entitle the purchaser to the 2 cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

Bird and Mammal Skins.

Summer Tanager	$ 40
Indigo Bunting	20
Bobolink	20
Ruby-throated Hummer, female	50
Myrtle Warbler	15
Blackpoll Warbler	20
Horned Lark	30
Tennessee Warbler	60
Bluegray Gnatcatcher	20
Flying Squirrel	50
Red Squirrel (Chickaree)	60
Ground Squirrel (Chipmunk)	60
Golden Mouse	40
Harvest Mouse	40
Pine Mouse	40

Also many others. Reptiles and Batrachians alive and in alcohol.

H. H. & C. S. BRIMLEY,

Raleigh, N. C.

CUTS FOR NATURALISTS!

Large stock of Illustrations to select from. Send for sheet of specimens and prices of JOB PRINTING. Prices a little lower and work a little better than elsewhere. Write us what you want. **A. M. EDDY, ALBION, N.Y.**

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs**, including *Falco tinnunculus*, etc., etc.

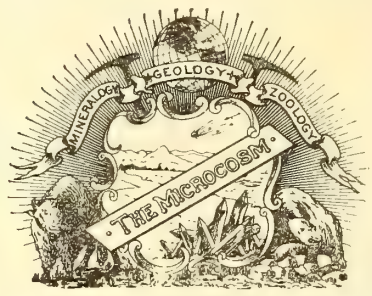
HERMANN ROLLE,

INSTITUTION FOR NATURAL HISTORY

Emdener-Str. 4, Berlin, N. W., Germany.

RARE SPECIES

Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.



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t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C

CORALS.

Distichopora nitida, yellow coral	$ 15
" " smaller	5
" coccinea, red coral	10
" " smaller	4
" violacea, violet coral	25
" " smaller	10
Stylaster sanguineus, pink coral, extra	25
" " good	15
" " small	4
Madrepora cervicornis, spike coral	25
" " smaller	4 to 10
" palmata, palm coral	15 to 75
" E. India spike coral, very fine clumps	75 to 1 50
Procillopora bulbosa, branch coral	4 to 15
" " fine clump	35
" verrucosa, E. India branch coral, an extra fine species	10 to 50
Occulina pallens, eye coral	25
Dendrophylla nigrescens, black coral	35
Galaxea fascicularis, bud coral	15
Dendrogyra cylindrica, cylinder coral	50
" " smaller	10 to 20
Pavonia, fungus coral, fine clump of this form	1 00
Fungia patella, mushroom coral	30 to 50
" (?) feather coral	40
Meandrina cerebriformis, brain coral, fine specimens	1 00 to 3 00
Meandrina clivosa, plate coral	50
" " smaller	10 to 25
Agaricea agaricites, propeller coral	10 to 2 00
Porites astraoides, pineapple coral	35
" furcata, forking coral	25
Orbicella annularis, star coral	35 to 75
Astræ (2 species), honeycomb coral	10 to 20
Dichocœnia eliptica, lace coral	15
" " extra large	50
Isophyllia diplacea, green coral	25 to 40
Manicina areolata, rose coral	4 to 15
Large variety of star coral, species not determined	1 00
Corallium rubrum, precious coral, used in making beads, etc	10
Corallium rubrum, large tube	35
Pterogorgia setosa, purple sea feather	75
" " smaller	30
" " small piece	10
" " fragment with egg shell clinging to it	15
Eugorgia aurantiaca, golden sea fan	40
Rhipidogorgia flabellum, purple sea fan	30
" occotoria, yellow sea fan	20
" " large	40
" elegans, spotted sea fan	45
Plexaura purpurea, purple gorgonia	30
Muricea distans, black gorgonia	35
Eunicea lima, scaly gorgonia	45
Pennatula borealis, giant sea-pen	75
" (?) smaller species	35
Tubipora musica, organ pipe coral	5 to 40
" " extra fine clump	1 25
Gemipora crater, crater coral	2 00

SPONGES.

Verongia, rope sponge	35
Tuba tube sponge	25 to 35
Euplectella aspergillum, venus flower basket	1 00 to 1 50
Hyalonema sieboldii, glass rope sponge	3 00
" " smaller	1 00

ECHINODERMS.

STAR FISH.

Ophiomusium Lymani, serpent star fish	$ 30
" " poor	15
Ophiopholis aculeata, spider star fish	20
" " extra fine	40
" " poor	10
Ophioderma longicanda, snake skin starfish	75
Astrophyton Agassizi, basket fish	40
" " large	1 50
" " very large	2 00
" " poor	15
Astropecten bispinosus, Chinese star fish	20
" (?) spiney star fish	30
" " poor	15
Archaster Agazzii, deep sea star fish	35
Asterias vulgaris, common star fish	10
" " extra large	25
" " small	5
" ochracea, lace starfish	40
Echinaster sentus, black star fish	25
Heliaster Kubingii, compass star fish	20
Oreaster reticulatus, giant star fish	60
Nidorella armata, armor star fish	20
" " larger	35

SEA URCHINS.

Cidaris tribuloides, club-spinned urchin	30
Diadema setosum, black spined urchin	25
" " large	35
Strongylocentrotus Drobachiensis, common urchin	10
Strongylocentrotus franciscanns, giant California urchin	35
Echinus, light colored deep sea species	25
" black, many spined species	35
Hipponoe esculenta, white spined urchin	30
Aristotles Lantern, the dental apparatus of last species	10

SEA BEAVERS and SAND DOLLARS.

Diplothecanthus rosaceus, Bahaman sea biscuit, 5 inches	$ 35
Laganum Bonani, rare Phillipian urchin	45
Echinarachnius parma, sand dollar	15
" " small	5
" (?) rare cushion sand dollar	30
Eucope grandis, rare giant keyhole urchin	50
Melitatestudinata, keyhole urchin	25
Schizaster fragilis, rare sea beaver	25
Brissus ventricosus, Bahaman sea beaver extra fine	45
Metalia pectoralis, giant sea beaver, a large long spined species, 10 in	1 15
Lovenia cordiformis, heart urchin, rare	45
Phomosoma placenta, flat urchin, rare	40

CURIOS.

Hermit crab in shell, large	20
" " " small	10
Sea horse, perfect	20
" " imperfect	6
Horsefoot crab, large	25
" " medium	15
" " small	10
Acorn barnacle, double	10
" " single	5
Tooth of sperm whale	35
Sturgeon plate	5
Eggs of nurse shark	20
Alligator tooth, very large	10
Porcupine quills	5
Chinese cash coin	3
Sawfish saw, 8 to 10 in	20

Large corals shipped by freight at purchasers expense. Small corals and everything else here listed sent *prepaid* at prices quoted. Everything listed in stock Sept. 15th. Orders attended to at once. Labels with both scientific name and locality furnished with all specimens. Address

ERNEST H. SHORT,

Albion, N. Y.

NATURAL SCIENCE NEWS

VOL. I. No. 35. ALBION, N. Y., SEPTEMBER 28, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

EGGS CHEAP. Costa's Hummingbird, sets of 2 with nest for 50c. Black-chin and Anna's at 40c. All letters answered. LEE CHAMBERS, Santa Monico, Cal. N.

A FIRST-CLASS Tenor Horn, nearly new, to exchange for a double-barrelled, breech-loading shot gun, 12 gauge preferred. Address at once, WILLIAM I. COMSTOCK, Norwalk, Ct.

FOR SALE:—An Eureka Folding Canvass Boat, only used two months; $10 cash gets her. Also will send the following skins, Am. Scaup Duck, Widgeon, Shoveller and Redhead for $2.50 cash. Correspondence solicited. FLOYD T. CODN, Milton, Wis,

FIDDLERS MUST GO! For every bird's skin sent me at *any* price, I will send one mounted Fiddler! Large Colubrine snakes wanted. Write at once. RICHARD PAINE, 57 Charlotte St., Charleston, S. C.

HAVE YOU a Field Glass or Revolver! If so write the undersigned, Have Stamp Collection $20, some good sets and w ll give part cash if necessary. GEORGE H. PEPPER, Tottenville. N. Y.

TENT FOR SALE.—7x9, made of 10 oz. duck, nearly as good as new. Will sell cheap for cash or perhaps exchange for a *good* ladies gold or silver watch. W. S. ROOT, Albion, N. Y.

I HAVE FOR SALE.—Sea Shells by the doz. or by the 100 or by the bbl, and cheaper than any one else sells them, also have Curious and Bird Eggs of different kinds, write and see. MISS IDA B. KIMBALL, New Cadiz P. O., Hillsboro Co., Fla.

EXCHANGE.—Hopkin's Allen make of Merwin Hulbert 22 cal. rifle with detachable 16 gauge shot barrel, worth 17 dollars. What can you offer? C. H. DICKINSON, Grand Rapids, Itasca Co., Minn. O.

TO EXCHANGE.—A good gold plated watch, Swiss movement, and chain. Warranted for 20 years. Will exchange for $15 worth of fine sets or Indian relics. GEO. W. DIXON, Watertown, S. D,

EXCHANGE.—Pair mounted Royal Terns. Want eggs in sets, shells, specimens or curios. WHIT HARRISON, La Crescent, Minn.

LOOK: To the first person sending me $2.50 I will send the following: 4 dozen fine arrowheads, 15 spear heads, 1 scraper and 1 knife. Prepaid. MURRAY EAST, Du Quoin, Ill.

FOR SALE.—Fine sets, full, original data, fine fossils, and minerals, at ¼ rates. Send stamp for lists. Will exchange for good cloth bound books. GEO. W. DIXON, Watertown, S. D. O.

WANTED.—Light roadster or racing bicycle, reliable make, changeable gear and reversible handles if possible, tool bag and tools, lantern, supporters, etc. Must be *strictly* in *good* condition. Send full description and state your *lowest* CASH price. GEO. GRAHAM, Andover, Mass.

FOR SALE.—A lot of good bird skins for sale very cheap. Write for list. B. F. WOOD, Winterburn, Pa.

CONFEDERATE Money is becoming scarce. Now is your chance to secure some fine original specimens for your cabinet or collection. $100 assorted bills for 25c, $500 for 50c, $1,000 for $1. Stamps taken. BOWEN BROS., Lansing, Ark.

WILL GIVE "Tom Jones" for best offer in 1st class foreign eggs, idcluding Moorhen. Book good as new. JACOB BASTIAN, JR., Statesville, N. C.

UNIO complanotus, Unio pressus, Unio radiatus. Anadonta excurvate, Anadonta fluviatilis, Anadonta subcylindracea. Fine specimens for 1st class sets. VERDI BURTCH, Penn Yan, N. Y.

I HAVE A few first class eggs in sets with full data to exchange for sets not in my col lection. Common ones wanted. F. C. NEWCOMER, West Mentor, Lake Co., Ohio.

A GENUINE African Ostrich Egg, dimensions six by five inches, endblown, for best exchange of rare singles not in my collection of 250. Satisfaction guaranteed or specimens returned at my expense. HARRY TRIPPETT, P. O. Box 802. Montclair. N. J.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths. PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf.

TO EXCHANGE.—An International Type-Writer, almost new, cost $100, for best offer. A. M. EDDY, Albion, N. Y.

WANTED.—Those having fossils named correctly, with geological formation, and locality, to send list with lowest cash price. W. A. STEARNS, Atlanta University, Atlanta, Ga.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

T PERCHES FOR SALE.—I have on hand 15.000 small T perches 3 inch base. I wish to dispose of these at once and in order to do so have put the price clear down to hard pan. Oak finished 5 cents each; pine, painted white, 4 cents each; pine, not painted, 3 cents each. All sizes will be turned to order. Sample sent prepaid for 10 cents in stamps. E. L. HALEY, Phillips, Me.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

Mica Crystals.

A new thing of great interest to mineral collectors. Groups of brilliant Hexagonal Crystals, emerald green in color and many of them transparent.

This is the only deposit of this mineral we have ever found, and the supply is limited.

Prices for Groups, 10c to $1.

Southern Mineral Co.,

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Fine Quartzes and N. C. Minerals in general. Indian Relics, &c. tf

FLORIDA SHELLS

In reach of all. Cheaper than the cheapest. Now is the time to start a collection.

1.	Strombus alatus, 2 to 3½ inches	4c
2.	Fulgur perversus, 3 to 8 inch	6
3.	Fasciolaria tulipa, 2 to 6 inch	8
4.	" distans, 1 to 3 inches	4
5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2¾ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ, 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch, single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon, 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

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Five Shot Pistol Gun, 38 cal.....$3 95
IXL Shot Gun, 44 cal..... 7 50
Double Barrel, 12 gauge 30 inch barrel, top action, 4¾ lbs., stub twist Lam' barrel.....13 50
"Full particulars given if desired."

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Glass Eyes, Tools, Tanning Liquor, etc.

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O N tf Hyde Park, Mass.

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NEW YORK CENTRAL

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THE FOUR-TRACK TRUNK LINE.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00

Florida Coast Shells

at less than cost!

Near the coast of Florida the mosquitos and sand-flies are such a pest and annoyance to the Collector, during the summer months, that we have concluded to employ the most of our time, from now until the first of October in the cleaning and packing of **Sea Shells.**

We therefore make you the following offer: From now until October first we will fill all small orders for Sea Shells at very little more than the actual cost of packing and postage.

We will fill any order from ten cents to $2, and give you a finer and larger collection for the money than you ever had before.

We have large quantities of Florida coast and river shells, and we take this method of reducing our stock before the autumn collecting begins.

Unless otherwise ordered we will send a general assortment, and each purchaser, whether large or small, will receive some fine and rare shells.

Send registered letter, currency or stamps.
Address,

The Ebersold Family,
Oceanus, Brevard Co., Fla.

SEE THAT ARROW?

That is the size of the beautiful Oregon, New Mexico and Arizona points of Chalcedony, Obsidian and Jasper found in those states.

Give reference and you can get a few on selection postpaid one way.

Have 10,000 flint arrows and spears from a dozen states.

I have recently found some white **Chalcedony Geodes** in the Bad Lands, South Dakota that are different and more elegant than any I ever saw from any part of the world. They are rarities, in size from a hen's egg to a goose egg and lined with brilliant sparkling, frost-like white crystals; a few amethystine tinted and a few with transparent selenite, and others like snow. I will send them postpaid for 25, 35 and 50 cents. Small ones unopened 10 and 15 cents.

You never had any Geodes in your collection as handsome.

Minerals from all parts of the world, especially the Black Hills and the west.

Cheyenne River **Fossils.**

Indian Buckskin Relics and **Weapons** from many nations.

Shells, Indian Photos of a hundred leading chiefs.

Send stamp for priced catalogue.

Natural History Establishment of

L. W. STILWELL,
Deadwood, S. D

Better Than a Shot Gun!

A Rare Chance

to obtain a high-grade Opera or FIELD GLASS at a very low price.

The entire stock of Queen & Co., Inc., being offered at great reductions, including some special forms for Naturalists.

Send for circular No. 481 giving full descriptions and prices.

J. G. GRAY, Assignee for

QUEEN & CO., Inc.,
1010 Chestnut St., PHILADELPHIA

MONEY! OLD PAPER MONEY!

6 varieties of Broken Bank Bills only 25c. A collection of 12 varieties from $1 to $10 only 50c. A dealer's lot of 100 mixed, 10 kinds, only $3.00. These bills usually sell at 10c each. 6 varieties of Confederate bills 25cts., 25 $100 Confederate bills, 2 kinds, $1.10. 12 Indian Arrowheads from N. C., only 50cts. All postpaid. Stamps, bills, etc., wholesale or retail. Your trade solicited.
Address J. E. HANDSHAW,
O95-34-4t Smithtown Branch, N. Y.

RARE SPECIES

Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

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Best books with fine illustrations on Insect Life published for the price.

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Natural Science News.

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A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Another Strange Insect.

Seeing an article in the NATURAL SCIENCE NEWS of July 6th concerning the "Strangest Insect in the World" or "Vegetable Worm" I wish to say that I have two of the queer beings in my collection, but American grown, both of which were found while working in our garden. The worms were grubs of "May Beetles," "June Bugs" or some similar species not distinguishable in the larval state, and were perhaps one and a half inches long in life. The fungus growth (if such it is) on one was about three inches in length and one-eighth in diameter when dug up, the other, two inches long; and for lack of spirits were preserved by drying, which lessened them considerably.

From the descriptions given (page 91) I do not hesitate to say that these worms and plants are very similar to those of New Zealand, although our grub is not confined to any particular food or locality and if I mistake not is affected similarly throughout the South. It is the belief of many of the natives here that they are the source of so much sassafras. This belief is probably grounded on the fact that there are many "grub worms" and much sassafras (especially for a few years after a new piece of land is opened up) and that an occasional worm is found with a sassafras sprout growing from it. Only a few days ago I asked a man how he knew it was sassafras and he said, "Well, it looked just like sassafras and had leaves just like it." He admitted that he did not taste one or have any further proof than from a sprout eight inches long with leaves.

Really, these sprouts do have the appearance of young sassafras just about to push through the ground, but my specimens had neither the smell nor taste of sassafras. They were purplish in color and were perfectly smooth and round-ended like the large roots starting from corn stalks just above the ground.

Instead of coming from the back of the neck as with the "aweto" the sprouts emerge just below the jaws on the right side, owing to the fact that this worm crawls on its back. The grub inhabits moist ground, rich in vegetable mould, and in shady places, under leaves, boards or in well manured soils. These were dead when found and were probably dead before the plant began its growth. They were a dirty yellow color, externally, and upon being sliced open lengthwise from front to back revealed the proper colors of the different parts, the stern end being blackish, and instead of veins, muscles, tissues, etc., all were of one solidified mass, and cut about like a wilted apple, although they were as plump as in life. There were no roots of the plants visible, any more than there is when you cut through the limb of a tree containing mistletoe. The internals seemed to be replaced by a homogeneous mass, while the head, jaws, legs and even the hairs were as perfect as in life.

Of course, being copied from another paper, the NEWS is not responsible for the contents of the article. However I feel as if there are some things mentioned that were misleading.

In the first place, how can there be any doubts as to whether the worm is animal or vegetable. If it bores in the ground and feeds on the roots of the rata tree then it must be animal, as plants have not the power to prey and feed upon *animal* tissue. It must be reduced to the *mineral* plane, by death or decomposition, whereupon it ceases to be *animal*. Vegetables often simulate animal forms but even a glance at them is sufficient for detection. There can be no doubt as to the one having been animal and the other vegetable. No authority will report a live worm crawling around with a bush growing out of its neck.

It would be declaring against the laws of Nature to say that the vegetable growth had attacked the living animal and appropriated it for food. Vegetables must look to the vegetable and mineral world for a food supply and cannot draw upon the animal, a higher life, until its identity as a member of the animal kingdom has been destroyed Fungus growths may find lodgement in animal tissue and thrive there, but they must subsist upon foreign matter, or broken down tissue which has not been thrown off by the living organism, but has ceased to be animal matter from the first moment of its decay. Then the "aweto" must have been dead or in a bad state of health before the plant could live in its body. Disease, in common usuage, means tearing down or decay of the tissues; then disease germs appear *as a consequence of* and *not* as a cause of disease, to dispose of the dead matter. Just in this way may the "aweto" and our common grub worm have been made use of by some fungus growths.

The last paragraph in the above mentioned article gives one the idea that all grubs of that species are attacked. If so, how could they long exist? How could the grubs pupate with a sprout sticking out of their necks? And if they are vegetable how could there be any chrysalis state? Our grubs here are strictly insects and have no special food, and so far as observed the plant is not a fungus growth.

C. E. PLEAS,
Clinton, Ark.

Hibernation.

To the real naturalist every thing in nature is of interest but there are some things so passing strange that our interests are not only awakened but our inner man is filled with awe and wonder while contemplating the deeper mysteries of the animal world about us.

Of the many curious and wonderful things in the realm of nature this habit of hibernation among certain animals is, to me, the most wonderful. From boyhood up I have lost no opportunity for studying this phenomenon, and since becoming a physician the mystery has deepened rather than dimin-

ished. How it is that a warm blooded animal, used to the most active and stirring life can suddenly suspend its life forces and lay for months in a comatose condition, is a mystery to me.

The one thing that I wish most to notice in this paper is the physiological changes attendant upon this voluntary stay of the ordinary activities of the animal economy.

In ordinary sleep the different organs do not suspend their action, but perform their usual functions as in daily action. The stomach digests food;the kidneys extract the waste elements from the blood;the villi of the intestines absorb pabulum for the nourishment of the body, and there is a general renovation and building up of the whole system. In hibernation it is quite the reverse, for, save respiration and circulation all other functions are practically suspended. The last meal that the animal eats, in November or December as the case may be, will be found in the stomach the following March. The kidneys do not secrete any material from the blood in this same time,because the bladder of an animal, killed after months of hibernation, will be found almost empty. The bowels do not move either, unless it be about Feb. 14th, when the male animals come out for a few moments, seemingly to forecast the weather. At this date the female, if a bear, has cubs some ten days old and never leaves her den until about April 1st. Animals never soil their dens under any circumstance.

When the animal retires to his den in the fall he is in good flesh and muscular, that is, the muscular tissue is in excess of the adipose. One would very naturally suppose that the animal after a fast of four or more months would be very lean and poor; but such is not the case, for when the animal first leaves his den in the spring, there is more fat wrapped within his wooly coat than when he entered it in the fall. [?—Ed.] This comes about not by any increase in the weight of the animal, but by a fatty degeneration of the muscular tissue, so that when the animal comes out in the spring he has much fat and little muscle. Should you kill this animal ten days or two weeks after his leaving the den you would find him as *poor* as the proverbial Job's turkey. A few days diarrhœa brought on by eating fresh clover or other green grass very soon runs the fat off.

Nature is a wise provider for the wants of her offspring. It is a well established fact that no animal can starve to death so long as there is fat to supply the system its necessary fuel. The animal goes into its den with a supply of fat covering the body; the excretory organs all cease action, and the economy fearing a *scarcity* begins at once to transform the proteid material of the muscular tissue into oil. How this is done no one knows, but that it is done I am most certain.

It is very evident to me that this fatty degeneration is brought about solely by a total cessation of physical and nervous energy. When both the muscles and nerves cease from work there is no broken down material to remove, consequently the excretory organs have nothing to do, and the extra muscular tissue developed during the summer's activity, left to itself with nothing to do very readily degenerates into fat.

G. W. Harvey, M. D.,
Williams, A. T.

Spider Farming.

Although entomologists have often raised spiders for purposes of scientific observation and investigation, spider raising as a money making industry is something rather novel. One has only to go four miles from Philadelphia, on the old Lancaster pike, says a Philadelphia paper, and ask for the farm of Pierre Grantaire to see what can be found nowhere else in this country, and abroad only in a little French village in the department of the Loire.

Pierre Grantaire furnishes spiders at so much per hundred for distribution in the wine vaults of merchants and the nouveaux riches. His trade is chiefly with the wholesale merchant, who is able to stock a cellar with new, shining, freshly labeled bottles, and in three months see them veiled with filmy cobwebs, so that the effect of twenty years of storage is secured at a small cost. The effect upon a customer can be imagined, and is hardly to be measured in dollars and cents. It is a trifling matter to cover the bins with dust, but to cover them with cobwebs spun from cork to cork, and that drape the neck like delicate lace, the seal of years of slow mellowing, that is a different matter. The walls of Mr. Grantaire's spider house are covered with wire squares from six inches to a foot across, and behind these screens the walls are covered with rough planking. There are cracks between the boards apparently leftwith design,and their weather-beaten surfaces are dotted with knot holes and splintered crevices. Long tables running the length of the room are covered with small wire frames, wooden boxes and glass jars. All of these wires in the room are covered with patterns of lace drapery, in the geometrical outlines fashioned by the spider artists. The sunlight streaming through the door shows the room hung with curtains of elfin-woven lace-work.

It is not all kinds of spiders that make webs suitable for the purposes of the wine merchant, and those selected by Mr. Grantaire are species that weave fine, large ones of lines and circles. They are the only webs that look artistic in the wine cellar or on the bottles. The spiders that weave these are principally the *Eperia vulgaris* and *Nephila plumipes*.

When Mr. Grantaire has an order from a wine merchant, he places the spiders in small paper boxes, a pair in a box, and ships them in a crate with many holes for the ingress of air. The price asked, ten dollars a hundred, well repays the wine merchant, who, at an expenditure of forty or fifty dollars, may sell his stock of wine for a thousand or more dollars above what he could have obtained for it before the spiders dressed his bottles in the robes of long ago. Mr. Grantaire has on hand, at a time, 10,000 spiders, old and young, the eggs of some of which, the choicest, he obtains from France.

When the mother spider wishes to lay her eggs, she makes a small web in a broad crack, then she lays say fifty eggs, which she covers with a soft silk cocoon. In two weeks (or longer in winter) the eggs begin to hatch, an operation that takes one or two days. The egg shells crack off in flakes, and the yonng spiders have a struggle to emerge. Then they begin to grow, and in a week look like spiders. They often moult, and shed their skins like snakes. The brood has to be separated at a tender age, else the members of the family would devour each other until only one was left.

Excavations in the interior of the Coliseum at Rome, which were abandoned in 1878, are soon to be begun again, by order of Dr. Baccelli, minister of public instruction.

Can Snakes Hypnotize?

Having read the article by Harold S. Ferguson in the Sept. 14th NATURAL SCIENCE NEWS I send the following:

A few years ago a hole was discovered in the door-way of the stable, on our farm near this place. It was freshly dug, but by what animal I do not know. The door was on the north side of the barn and the chickens had gathered there during the heat of the day. One of the family chanced to look toward the barn and noticed all except two of the chickens were standing at some distance from the door. The two which remained were, a young chicken about as large as a quail, and its mother. The old bird was fluttering around, seemingly in great distress, the young chicken stood perfectly still, its head slightly lowered and its eyes fixed on some object near the hole. I went to the barn to discover the trouble, as I approached the hen ran away, but the young chicken did not move. On the ground near the hole and 3 feet from the chick was a garter snake nearly 2½ feet long. It was partly coiled and did not move until I came within 3 or 4 feet of it. It then removed its gaze from the chick and went into the hole. I picked up the chick, when it gave a few feeble cries and appeared to have a fit. It moped around for several days, when unfortunately it was accidently killed. It never recovered from the effect of its fright or whatever we may call it and when alarmed would fall on its side and utter low distressed cries. Had the snake exerted some strange power over the chicken's will or was it merely fright?

CLYDE BINGHAM PARKER,
Oberlin, Kans.

Photographing an Eclipse.

During the recent eclipse of the moon, I assisted a friend to make a few photographs of it. As this was our first attempt at any thing of this kind, perhaps an account of our experience would be of interest to others interested in amateur photography.

The camera used was a 5 by 7 with a lens of eight inches focus. The plate an ortho-chromatic of non-halation.

By using the back combination of the lens at the end of tube 8 or 9 inches long, placed on the front end of the lens tube proper, the size of the image on the screen was doubled making it about ¼ of an inch in diameter. After carefully focusing, with a focusing glass, the exposures were made:

The first was made before the eclipse was on, and the plate was exposed about four seconds. The plate was developed immediately and was found to be overexposed, therefore the following exposures were of one second each.

The first exposure was made when the moon was about half covered by the shadow, the next when it was about two-thirds covered. After these exposures were made we concluded to wait until the shadow was passing off before making another.

But for various reasons, (we went to sleep) there were no more exposures made that night.

On development the plates were found to be very good ones, the exposures having been correctly timed and we got some good prints from them. On the whole we are very well satisfied with our experiment.

I might add that the last exposures were all made on the same plate by simply following the moon with the camera. The images were placed far enough apart to destroy all unpleasant results arising from halation, but because of the plate used we were not troubled by it, in fact the images were very clean cut and sharp, quite equalling our fondest expectations.

W. CARL ACKISON,
Charleroi, Pa.

El Capitan Meteorite.

This handsome meteorite was found by a Mexican sheep herder, Julian Jesu, in July, 1893, on the northern slope of El Capitan range of mountains in New Mexico. Three small pieces were broken from the thin edge, which show beautifully the octahedral structure of the iron. The smallest of these, weighing a few ounces was sent to the National Museum, and the two larger, weighing respectively 1 pound 12½ ounces and 3 pounds 14 ounces, together with the main mass, 55 pounds came into my possession at different dates in 1894.

The weight of the iron when whole was about 61 pounds. It measured 10x9x5 inches, thinning at one edge, and had the usual irregular pitted surface.

My information in regard to the history of the meteorite, as well as the meteorite itself, was obtained from Mr. C. R. Biederman, of Bonito, N. M. Mr. Biederman says that he, in company with many miners, was standing in front of a store in Bonito some time in July, 1882, when "they saw a meteorite which looked like a fiery ball moving rapidly toward the north at an angle of 45° and vanish behind the Capitan range." Mr. Biederman thinks the meteorite found by the Mexican is the one they saw fall, and there is nothing in its appearance to disprove his claim. It is entirely free from oxidation and evidently fell at a comparatively recent date.

The Widmanstatten figures are developed very easily and clearly, as is usual with irons containing the percentage of nickel which this has, showing it to belong to the usual type of octahedral irons, with rather broad bands of kamacite somewhat like those in the Cooperstown meteorite.

I am indebted also to the courtesy of Professor Clarke for the following analysis of this iron by Mr. H. N. Stokes, of the United States Geological Survey:

Fe	90·51
Ni	8·40
Co	0·60
Cu	0·05
Si	tr.
P	0·24
S	tr.

—*E. E. Howell in Amer. Journal Science.*

The Forests of Alaska.

The forests of Alaska get so much assistance from the atmosphere, in comparison with trees growing in dryer climates, that the trees grow so close together as to be in many cases comparatively worthless for timber. *Abies Menziesii* and *A. Mertensiana*, together with a considerable sprinkling of the Arbor vitæ, *Thuja gigantea*, form the bulk. Though of little service for timber, they are of immense value to the natives, as from the roots of these trees they obtain fibre which they employ in making baskets, twine, and cord for many valuable purposes.—*Meehan's Monthly for September.*

Dr. Gunther, the well-known head of the department of zoology in the British museum, is to be retired on Oct. 1, owing to the age regulation.

PENIKESE—A Reminiscence.

By One of its Pupils.

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Our dredging was carried on between times, so that, during the heat of the day, we were upon the water. Upon our return Professor Packard would tell us about the crustaceous animals and the insects that we had captured; Professor Morse would take up the subject of the shells and molluscous animals procurred; were there specimens to be examined through the microscope, Professor Bicknell's time was occupied, day and night. Then Professor Jordan described to us marine algology; Guyot, physical geography; Brewer, ornithology and oology; Hawkins, extinct mammalians; and Mr. Roetter taught us to draw them all. Then a dozen other gentlemen talked to us upon a dozen other subjects, so that our note books and our heads, I might well say our hearts too, were full ! full ! full of animals and the animal kingdom and Professor Agassiz, who knew all that there was to know about them both. Well do we now look back upon Penikese as the leading scientific school ever, before or since, in existence. Many believe that it will *never* be excelled in its character, or in the ability of its corps of instructors. This may be going far,—yet it is as certain that its stimulus and influence will be felt in scientific education for years, it may be for centuries to come.

Professor Agassiz had expressed the wish, that the school at Penikese should be "associated with the Museum of Comparative Zoology in such a way as to share at once and forever in any advantages to be derived from an institution so kindred in its objects and aims." He thought, and perhaps very wisely and truly, that "the two establishments," could "work together to the greatest advantage of both." The latter institution is today a monument alive to fame,—the fame of *one* man. A man whose chief aim and accomplishment was *to work and to teach others to work.* In his instruction he says: "I must make hard work a condition of a continued connection with the school." The *nature* of this "hard work" was "to prepare those who shall attend to observe for themselves." More fully, it was, "to study nature." He says: "We should make nature our text-book;and finally, disparaging text-books as generally mere compilations of useless and untrue materials, he asserts, again and again, that "we invariably return to the study of the things themselves, whenever we wish to make any real progress." nobly did he practice his own teachings.

Athough the name of Agassiz will be handed down in history as the leader of scientific thought in the nineteenth century, it is yet certain that the Master of Penikese was neither afraid nor ashamed to acknowledge that to another was due the idea of establishing a school, after the manner in which his own classes were taught, but on a larger scale. In a letter to Mr. Anderson he says: "I have long cherished the thought of a summer school like the one proposed, and I have at various times in my life tried it with small classes, and for a few days or weeks at a time. The idea of establishing one at Nantucket, on a larger scale, was suggested by a young friend, Professor N. S. Shaler, who had a special taste for and no little experience in this kind of teaching;" but generosity was a failing with Professor Agassiz. He showed it again in relation to the *name* of the proposed school, when he wrote to Mr. Anderson: "As to its name, I hope you will allow the school to be named for you;" and, "my name it cannot bear with any propriety;" and still again, "To name it after you is, therefore, the simple and appropriate way of settling the question." Mr. Anderson, with equal generosity wrote: "I learn from Mr. Girod that you have expressed a wish to mark your appreciation of my gift of Penikese for the purpose of the institution, by naming the latter after me. I feel necessarily deeply flattered by this offer, and can only say in reference to it that I leave that part of the question entirely in your hands, simply suggesting whether an institution, the initiation of which has been wholly the result of your own industry, and which must depend for success mainly on your own labors, should not more aptly receive its designation from a name which has become almost a household word wherever science is known and appreciated,—that of Louis Agassiz." Thus in a contest of generosity will two names be handed to posterity.

Let me here say a few words, and a few words only, of the donor of Penikese Island: Mr. John Anderson of New York, who generously gave the island for the school, and seconded his gift by a donation of fifty thousand dollars ($50,000) for its erection and maintenance. This school, it will be remembered, has been styled both "The *Agassiz* School of Natural History at Penikese" and "The *Anderson* School of Natural History at Penikese." The former, from its founder; and the latter, from its donor; but there seems to me no necessity for either injustice or confusion in the matter, whichever of these titles are made use of, provided it be borne in mind that the *Anderson* School was simply a financial and substantial realization, upon a larger scale, of the *Agassiz* School of Nautucket. In the winter previous to the opening of Penikese the *Agassiz* School had been conceived, arranged for and advertised, from the Museum of Comparative Zoology, at Cambridge, Mass., (December, 14 1872) as a "Course of Instruction in Natural History to be delivered by the seaside, *in Nantucket*, during the Summer Months, chiefly designed for Teachers who propose to introduce the Study into their Schools, and for Students preparing to become Teachers." No fair minded person will, then, for aninstant, regard it as an injustice to either of the noble men to recognize the school by either or both of these titles; for it comprised both. I regard Mr. Anderson's motive in making the whole donation as purely and wholly philanthropic. A simple, short paragraph, clipped some years later, from a newspaper, whose date even is unknown to me, reads: "Mr. John Anderson, the founder of the Agassiz College, at Penikese Island, died at Paris, France, on Thursday, aged 69 years." Alas, that as I write, Anderson, Agassiz and Penikese, exist save as a memory—yet, as such, they will last, with *me* at least, *forever* and again *forever*!

As in the establishment of Penikese was recognized as a new departure in scientific education, to provide for its future, and that the public might at once fully understand its proposed scope, Professor Agassiz advertised:

"The applications for admission to the Anderson School of Natural History are so numerous that it has been decided that the successful pupils of a preceeding year should have the first claim to admission the following season; next, the principals and professors of colleges and of high and normal schools; next, teachers in other public institutions; and, finally, teachers in private schools. Beginners cannot be admitted until after the applications of these several

(*To be continued.*)

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Sun shell, pairs	04	30
East India clam, pairs	25 to 40	2 25
Ham shell, pair	10	
Razor shell, pairs	12	
Cockle shell, pairs	20	
" " single valve	06	40
Asaphis, pairs	05	30
Venus, pairs	14	
Angel wings, pairs	30	
Chama	06	
Purple clam	15	
Striped clam	08	40
Tapestry shell	08	
" " large	24	
Radiated scallops, pairs	05	
" " odd valves	02	12
Eng. scallops, mammoth, odd valves	10	
Australian jewel shell, odd valves	08	50
Ark shell, pair	10	
California cockle, pair	60	
Rough cockle, pair	35	
Jap. Sun and Moon shell, pair	20 to 45	
Heart shell, pair	10	
Mother of Pearl, pair, fine	45	
" " " single valve	20	
Thorny Oyster, pair	1.00 to 3 00	
" " single valve	45	
Banded tree snail	12	1 00
Wavy " "	12	
Phillipian tree snail	15	
Yellow " "	20	
Red-mouth "	10	
Mammoth "	15	
Green "	12	90
Radiated "	12	
Oregon "	08	50
Spotted "	04	25
Agate shell, large	40	
" " small var	04	30
Peanut "	01	08
Tusk shell	01	08
" " mammoth	15	

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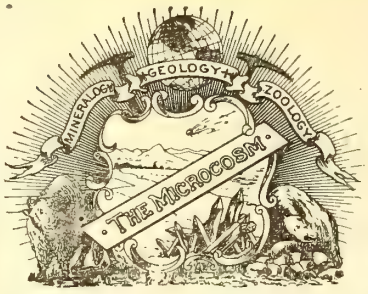

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ALBION, N. Y.

NATURAL SCIENCE NEWS

VOL. I. No. 36. ALBION, N. Y., OCTOBER 5, 1895. Weekly, $1.00 a Year

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WANTED.—1, 2, 3, 4, 5 Annual Reports of Bureau of Ethnology for Insect Life '90, '91; 9 and 10 Annual Report of Bureau of Ethnology. L. B. GARY, Hiram, Ohio.

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Hooded Warbler	45
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Louisiana Water Thrush	50
Water Thrush	20
Ovenbird	20
Pine Warbler	20
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7. " muricatum, 1½ inch single valves	1
8. " serratium, 1 to 2½ inch	3
9. Arca ponderosa, 2 to 3 inch	3
10. " noæ, 1 to 4 inch	3
11. " floridanum, 2 to 2½ inch	3
12. Cytherea (callista) gigantea, 3 to 5 inch	10
13. " " maculata, 1 to 2½ inch	6
14 Natica duplicata, 1 to 3 inch	2
15 Chama Arcinella, 1 to 2 inch	5
16 Dosinia discus, 2 to 4 inch	5
17 Pholas costatus, 3 to 6 inch, double valve	15
18 Murex pomum, 1 to 3 inch	3
19 " salleanus, 1 to 3 inch	5
20 Pyrula papyratia, 3 to 5 inch	8
21 Pecten exasperatus, ½ to 3 inch, single	1
22 Conus Floridanus, ¾ to 1 inch	2
23 " proteus, 1 to 3 inch	10
24 Pinna muricata, 4 to 10 inch	8
25 Lucina edentula, 1½ to 3 inch, single	2
26 Cancellaria carolinensis, 1 to 1½ inch	3
27 Oliva litterata, 1 to 2½	2
28 Anomia ephippium, 1 to 2½ inch	1
29 Melongena subcoronata, 2 to 6 inch	8
30 Cerithium eburnum, 1 to 1½ inch	3
31 Turritella, 1 to 1½ inch	2
32 Tellina, ½ inch	1
33 Marginella, ¼ inch	2
34 Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
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37 Skate eggs	5
38 Rose coral, shaped like a rose	10
39 Florida air plants	10
40 Tarpon scales	2
	$2 15

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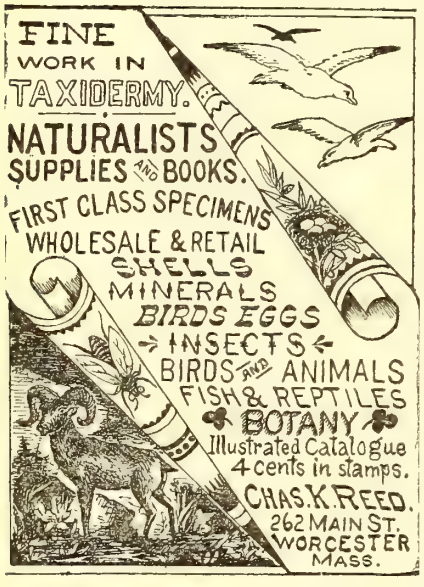
Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.
Rochester.....		8:00	10:30	2:20	5:35	10:00	
Albion	7:00	9:10	11:35	3:25	6:50	11:06	
Lockport.....	8:05	10:05	12:22	4:20	7:40	12:00	
Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20	12:35	
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45	
Buffalo.....	8:55	10:55	1:25	5:15	8:45		

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00



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American Coot	25
California Quail	25
American Rough-legged Hawk	1 00
Swainson's Hawk	75
Blue-headed Euphomia	50
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American Eared Grebe	35
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B. B. Cuckoo	20
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Spurred Towhee	15
Rose-breasted Grosbeak	20
Snow Bunting	10
Indigo Bunting	15
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Chestnut-sided Warbler	10
Black-throated Green Warbler	10
Prairie Warbler	15
Black-poll Warbler	10
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Surf Scoter	1 50
Black-crowned Night Heron	1 50
American Woodcock	1 00
Knot	1 00
Bob-white	75
Ruffed Grouse	2 00
Sharp-shinned Hawk	75
Broad-winged Hawk	75
Bald Eagle, male	6 00
Pigeon Hawk	1 00
Barred Owl	1 50
Snowy Owl	5 00
Great Horned Owl	4 00
Red-bellied Woodpecker	75
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Red-winged Blackbird	40
Scarlet Tanager	75
Barn Swallow	50
Yellow-breasted Chat	35
Black and White Warbler	35
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Drongo Shrike	1 00
Massena Lory	1 00

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Group of American Scaup Ducks, male, f and jv. male, w nter scene, finest work, size 20x32	12 00
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Original Oil Painting, of hanging dead game and hard wood panels, birds life size, unframed, each	5 00
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The above are the finest paintings of game in the country and are guaranteed to give satisfaction or money refunded.

Any birds desired will be painted to order.

I have on hand at present California Quail, pair on Sycamore panel, Yellow Hammer and Meadow Lark on Tulip Tree Panel; pair of Plumed Partridge, on oak; Ruddy Duck, on yellow pine; Blue-winged Teal, on ash; Green-winged Teal, on oak; Pair of Knots, on pine; Black-bellied and Golden Plover, on oak; Avocet, on tulip.

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Natural Science News.

VOL. I ALBION, N. Y., OCTOBER 5, 1895. No. 36

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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A Moss Agate.

Riding along the prairie trail one day
I chanced upon a stone of smallish size,
Furrowy and rough, displeasing to the eyes,
Of pallid yellow hue and blotched with gray.
I kept the stone for years and deemed it naught
Of worth, save for a pocket-piece, until
A lapidary's hand with wondrous skill.
Revealed the secret beauty long unsought
And, as the moss was hidden in the heart
Of that rude stone, since some dim age of man,
Only to be wrought out at last by art—
Which may be but a part of God's great plan.
Yon farmer boy now drinking at the well
May prove another Shakespeare—who can tell?

John N. Hilliard. Ex:

Charles Valentine Riley.

It is with deep sorrow we record the death of this distinguished and indefatigable worker in science. In Washington, on the morning of the 14th of September, in company with his son, Prof. Riley started on his wheel for the city from his residence, Wyoming Avenue. They bowled on at a fast rate all along the route, until when the level space was reached at the foot of the hill where Connecticut Avenue intersects with S Street, the wheels were flying with more rapidity than the careful professor usually attained. Suddenly the front wheel of his machine struck a small rock and twisted completely around. The shock was so sudden that Prof. Riley was thrown violently forward over the handle bars and landed on his head and face. He retained his hold on the handles, however, and the bicycle fell on top of him. He was unconscious when picked up.

A number of physicians were summoned at once, and within a few minutes the sufferer was receiving treatment.

Blood was flowing from the ears, indicating that there was a fracture of the skull. He seemed to be almost at death's door when he was lifted into the ambulance and carried to the home from which he had gone in full health and vigor but a few minutes before. The skull was found to be fractured at the base of the brain. The patient gradually sunk, and at 11:50 p. m. life passed away.

The name of Prof. C. V. Riley is a familiar one to our readers. He appeals to them as the author of some of the most interesting papers which we have published in the *Scientific American* and *Supplement*, and many of our readers are under special obligations to him for the work he has done in solving problems in entomology. In the scientific world it may be said that no entomologist stands higher than he. His career is of special interest as showing the typical self-made man, whose life is identified with America, and whose first steps, after his school and college days, were taken on the farm and in the service of the press.

We cannot do better than repeat here the interesting sketch of Prof. Riley's life and labors given not long ago in these columns.

Charles Valentine Riley was born in London, September 18, 1843. His early life was spent in rural England, much of it in the pretty village Walton-on-the-Thames, between Hampton Court and Windsor. At the age of 11, he entered the College of St. Paul, Dieppe, France. After three years' attendance there he spent three years more in a private school in Bonn, Prussia.

Even in these early days his talent for drawing was noticeable, and curiously enough, as an indication of the future he had a great fancy for producing exquisite delineations of butterflies, moths and other insects.

While his drawing teacher, Prof. A. Hoe, was urging him to repair to Paris and devote himself to art, he was by family circumstances thrown upon his own resources, and at the early age of 17 he sailed for America, went West and settled with Mr. G. H. Edwards, Kankakee County, Illinois, on a stock farm.

Three years were spent here, years during which the boy was distinguished by his love of work and by a most marked tendency for original research, which took the direction of the improvement of farm processes and of farm stock. Those who know him say that there is but little doubt that he would have made a mark as an advanced agriculturist had not his health failed him under the great strain, so that at the age of 20 years he went to Chicago. Here he had his early trials. He actually worked in a pork packing establishment, made portraits of his fellow boarders and made sketches which he personally sold to appreciative purchasers. At last he obtained an engagement as a reporter on the Evening Journal, and next changed to the Prairie Farmer, at that time the leading agricultural paper of the West. His especial department was botany and entomology, and in the interest of that department he traveled extensively. His enthusiasm, industry and versatility soon made his services invaluable. A curious illustration of the bent of his mind is shown in the fact that he here learned type-setting simply because he was determined to have some trade at his command. The development of insects was one of his main studies, and the results of many original investigations and the answers to many inquiries were published by him in this paper. In May, 1864, he enlisted in the army, serving for six months with the 134th Illinois volunteers. The regiment disbanding six months later he returned to his paper, severing his connection with it in the spring of 1868 to accept the office of State Entomologist for Missouri. At last we find him fully launched upon his career, and from 1868 to 1877 he did the work which firmly established his international fame.

His salary was but $3,000 per annum and there was no allowance for expenses, yet out of this

amount Prof. Riley paid his assistant and traveling expenses. He also paid for the beautiful illustrations of the reports, which illustrations were drawn by himself. The original edition of the reports have been long exhausted, and any copies now bring very high prices. Charles Darwin, the famous naturalist, gave them the highest encomiums. In connection with Mr. B. B. Walsh, Acting State Entomologist of Illinois, Prof. Riley established the American Entomologist about this time.

In 1873 a bill was passed creating the United States Entomologic Commission, with Prof. Riley as chief, and Dr. A. S. Packard, Jr., and Cyrus Thomas as associates. This commission was designed to cope with the Rocky Mountain locust, then doing great damage, and in the five years of its existence published five large, fully illustrated reports, besides seven bulletins, all the work being done by the three members.

Since this period, with an intermission of two years, Prof. Riley held the position of United States Entomologist, wwich he resigned a few months ago. His work at Washington fully upheld the promise of his early years. In carrying on the operations of his department, working night and day, year after year, without rest, he nearly ruined his constitution. To the National Museum he presented his magnificent private collections of insects, representing the labor of twenty-five years. With it as a nucleus he built up a collection unsurpassed in America.

Applied entomology or economic entomology, as it is sometimes called, was his specialty, and he in some sense was the founder of that science. Space is not at command to even summarize his work. After his studies on the Western locust problem, he took up the animals affecting stock in the lower Mississippi, those affecting the hop industry and cranberry growers, and in all those lines he did useful and practical work, ameliorating greatly the troubles or the farmer.

In the past few years, two of his studies have produced epoch-making results. One is his famous emulsion of kerosene oil; milk or soap solution being the emulsifying agent. Having found that this was an infallible insecticide, he had to devise means for applying it, and invented the "cyclone," "eddy chamber," or "Riley system" of nozzle for spraying it upon trees. Another of his achievements was the introduction of the Australian ladybird, *Vedalia cardinalis*, into California, to destroy the white scale, which was then ruining the orange groves. The result was simply magical. Since then the insect has been introduced elsewhere. It is interesting to note that other attempts of the same sort that have been made in California, against other insects, either against his advice or without his indorsement, have not had the same success. His discoveries in relation to the phylloxera alone were enough to give him international renown, and his recemmendations have been followed by grape growers in all parts of the world. He was a good voluminous writer; a bibliography of his writings, published by the Department of Agriculture, five years ago, showing over 15,000 titles.

It would take much space to give the simple list of the honors in the way of medals and diplomas honorary memberships of societies and the like which have been showered upon him. One of his greatest honors was the gold medal presented him by France in 1873, in appreciation of his services in the study of the phylloxera. His work will live. His organization of the Entomological Department of the United States government will be responsible for much of the value and utility in the future, and lands as far apart as Egypt, the Sandwich Islands, California and France are today reaping the benefits of his work. His resignation from the Department of Agriculture was commented upon as a serious loss, brought about by his absolute need for rest and by other causes affecting his professional work. It was believed that the vacation which he at last gave himself might be productive of the most important results to humanity in the direction of his favorite science.

As a lecturer his reputation was extended. He has held appointments as lecturer on entomology at Cornell University, Kansas State Agricultural College, Missouri State University and the St. Louis Washington University. He has also lectured before the Boston Lowell Institute and the Brooklyn Institute. He edited the fifth volume of the Reports on theParis Exposition of 1889, a work of nearly a thousand pages, with text, figures, and plates, a work containing a mine of valuable information on agriculture and agricultural education, not only of foreign countries, but of our own. So much of his writing was in the form of monographs and addresses and it contained so many titles, that it cannot be summarized here. —*Scientific American.*

Directions for Collecting Minerals.

GENERAL REMARKS.

The value of a mineral collection depends largely upon the quality of the specimens and upon the completeness of the information concerning them. A bruised or scratched specimen, or a broken crystal, has little to recommend it, and a mineral of unknown locality or undefined associations can be admitted to a cabinet only under protest. With regard to any given species, the geographical and geological distribution is an important fact; and it is therefor desirable, in each locality, to collect every variety which can be found. Specimens which would be worth little by themselves become valuable when studied in relation to others, and a common mineral, found under unusual circumstances, may have exceptional interest.

WHERE TO LOOK FOR MINERALS.

The best field for a collector is always that which has been well opened, such as a mine, a quarry, a railroad cut, etc. Fresh exposures of unweathered rock yield the best specimens. In prospecting, however, where no work has been previously done, it is desirable to get below the weathered rock surface to the fresh material beneath. Sometimes nature assists in this direction, as in ravines and along the bases of cliffs where, in early spring, rock falls leave clean exposures. The recent talus at the foot of a cliff affords a good field for examination.

IMPLEMENTS USED IN COLLECTING.

The tools used in collecting minerals are few in number. The first and most indispensible tool is a hammer. It should be of well tempered steel, weighing about two pounds, with the striking face square and the cutting edge having the same direction as the handle. The handle should be made of good hickory and wedged into the head with iron wedges. A foot scale, divided into inches, marked on the handle, is desirable.

It often happens that upon specimens brought in from the field there is an unnecessary amount of the gangue adhering, or part of a crystal or crystals may be covered up the matrix. This can readily be removed and the size of the specimen reduced by means of a few small chisels and cleaning tools and a trimming hammer. The trimming hammer should weigh from a quarter to half a pound, and have both faces square. By holding the specimen firmly in the left hand and delivering a sharp blow with the hammer the gangue rock may be removed without injury to the mineral. A pitching tool is used in shaping the specimen after trimming. The other tools needed are three steel chisels, one six inches long, the others three inches long and of similar pattern, for cutting purposes; a set of steel wedges for splitting rocks, and a pickaxe to remove surface material and for prying.

In many cases it is necessary to blast. Blasting powder, drills, sledge hammers, fuses, etc., may sometimes be carried, but they can commonly be borrowed from miners or quarrymen, who can also be hired to assist in the work. Avoid heavy charges of powder, in order that the material sought for may not be excessively shattered. The operation of blasting, regarded from the standpoint of the mineral collector, requires the greatest care and judgment. A fine locality may be ruined by the reckless use of dynamite.

METHOD OF LABELING.

In collecting minerals, the labels should be written at once, and wrapped with the specimens. The locality should be stated precisely; for example, "garnet in rhyolite, North Slope, Table Mountain, Gunnison County, Colorado," and not "garnet, Colorado," Unidentified minerals should be marked with full information as to mode of occurence, in order that they may be properly studied later.

It is always wise to preserve a record of the materials in some form of field notebook.

PACKING FOR SHIPMENT.

For the transportation of the material to a place where it can be properly culled and packed a leather bag is convenient. This should be made twelve inches wide, twelve inches deep, and four inches through of stout leather. It should have a flap over the top and extending fully six inches down the opposite side, and have a strap and buckle to fasten it in position.

The carrying strap should be of strong leather, two inches wide, and long enough to go over the shoulder. This should be provided with a buckle so that its length may be adjusted to the wearer.

This style of bag is of course not a necessity, and any sort of a receptacle may be substituted for it, but some means for the convenient transportation of specimens in the field must be provided.

A supply of paper, preferably of newspaper, is also indispensible for wrapping specimens. Never attempt to carry a specimen unwrapped in the bag. The material collected must not be permitted to chafe or rub.

In packing specimens for transportation, each individual is to be wrapped first in tissue paper, then in raw cotton, and finally in newspaper. The applies only to crystalized and delicate specimens. For massive material newspaper alone is sufficient. With very delicate material such as cuprite, natrolite, etc., the specimens are to be wrapped in tissue paper, then in cotton, and further protected by being boxed separately. In some cases it is advisable to set the speimens in a suitable box and pour plaster of paris around its base, allowing the latter to set, thus insuring solidity. This, however, is a matter that must be left entirely to the judgment of the packer, since no one method is applicable to all cases.

The material is best packed in comparatively small boxes. Large boxes are too heavy for proper handling. A layer of excelsior, straw or other packing material, about an inch deep, is put on the bottom; then the heaviest and most massive material is packed firmly and closely. Spaces between the specimens should be filled with excelsior; then add another layer of excelsior, a layer of specimens, and so on until the box is filled, and finally a layer of excelsior is put on the top and the cover fitted tightly. The box must be absolutely full before fastening. Excelsior is the best packing material, but straw, hay, grass, Spanish moss, or coarse shavings will serve the purpose. *Sawdust should never be used.* Coarse, massive material, collected in bulk to be broken up and trimmed later, may be transported in boxes or barrels without wrapping or other special precautions.—*By Wert Tassin, Assistant Curator of the Department of minerals of the Smithsonian Institution, in the Mineral Collector.*

Tray Making.

A neat cabinet is indispensible if the owner wishes his specimens to show up well. No matter if the case is of fine hard wood, scroll work and handsome glass front, the contents do not look well unless arranged with system and neatness. To have this system and neatness, good trays are essential. If the trays are single they will not fit close together and besides form a double partition between each specimen, and if we wish to empty a shelf or drawer at any time, it necessitates considerable time to remove the specimens, single tray at a time. These objections are overcome by trays in the flat. They are good looking, cost almost nothing, and are easily made.

The materials necessary are a number of paper shoe boxes, a spool of strong thread and a quantity of liquid glue, mucilage, or smooth flour paste.

The lids of the boxes and the bottoms cut down equal to the lids are to be used as the bodies for the trays.

Cut strips of the boxes as long as the lids are wide and as broad as they are deep. These strips are to form the partitions. After they are arranged at the proper distance apart, wrap several wrappings of the thread around the box directly over and parallel to the partitions. Draw the threads tight enough to hold the partitions firm, then neatly tie the ends together.

Now cut strips of plain white paper, and carefully glue it over the threads to the cross pieces. Now place in the cross partitions and treat them in the same way. Of course the threads in this case run at right angles to the first ones.

If instead of covering them with white paper, different colors are used the contents may be made to show out well by contrast of colors.

Plain white specimens show best in black, red or blue, while white ones set off to best advantage, deeply colored specimens.

If cotton is used about specimens as in the case of birds eggs, it should be of the same color as the trays.

Otto Grady,
Ludlow, Ky.

PENIKESE—A Reminiscence.

By One of its Pupils.

Copyright secured 1895.

classes of pupils have been met. You are therefore requested to send me your claims to admission, before an answer to your application can be given.

Respectfully Yours,

L. Agassiz."

But a second year with Professor Agassiz was a happiness too great for mortal realization, so he was taken from us—"not lost, but gone before;" we can only follow in his footsteps and search for him. We will follow Nature to her beginning,—but we will find him again. The same patient, loving father, friend and brother, shall again clasp our hand, and direct our steps from Nature to Nature's God.

The second year, and the last, of Penikese, was conducted by Professor Alexander Agassiz, Professor Agassiz's son, who after the death of his father, assumed the responsibilities which the latter had left. This term was conducted on very nearly the same principle as the first had been. The "course" remained unchanged, in the main, and nearly all the old instructors and pupils returned. How hard we all worked! It was a delightful summer! Had we never attended Penikese the previous year, it would have seemed perfect. But we mourned for our Master. We longed for his genial face and kindly voice. To *one*, at least the second term of Penikese was but the skeleton remaining in the closet of the first term.

CHAPTER V.

Lectures: Morse, Putnam, Packard.

We are now at length settled quietly to work for the summer at Penikese. The bustle and excitement and arrangement in detail of the work of the first few days of our season are over, and we cheerfully "bend to the oar,"—of routine which is *not* routine, and of hard work which is truly a pleasure. Our time is all occupied: When we are not attending lectures, or out dredging, or otherwise collecting specimens we are in our laboratories dissecting specimens, using our microscopes, observing the animals and plants which we have collected, and which are lying around everywhere in pails and pans of water, or in copying out our lectures. Our table is covered with knives, scissors, forceps, hooks for holding back the surrounding membranes from those upon which we are at work, and various other utensils. There are bottles of alcohol, sea-water, glycerine, and other preserving fluids—some with specimens in them and some without; a large tin tray, about eighteen inches long and a dozen wide, half full of alcohol and water, in which are the remains of a skate-fish with the brains exposed, which we are dissecting with a view to showing the five pairs of nerves aud their surroundings exactly as they exist in nature, and with the outer membranes and flesh held back by pins, which are inserted into the wax in the bottom of the tray; and several birds, which had recently been shot, were lying upon the table ready to be skinned and mounted or dissected and bottled—as were our other anatomical specimens.

Then we go to our lecture room and take notes from our Professors as they talk to us. Well do I remember how hard Professor Morse labored to impart to us some knowledge of the Molluscous kingdom, or the so-called shell-fish. He told us of their position in the animal kingdom, of how they were grouped among themselves, of the internal structure of each group, and of the life histories of many of the individual species. Under his direction, we dissected many of the larger sea molluscs, which we captured in our nets and on the beach at low tide,—and found it a most pleasing occupation, to follow out the various systems which they exhibited, and to compare them with those in both the higher and lower groups.

I remember that one of his lectures was devoted to the Snails. In it he told us of this great group,—how that they were called by naturalists the *Pulmonata*—from the Latin *pulmo*, a lung; and *fero*, I bear—signifying; that which they in truth are, the lung-bearing mollusks. Then he explained to us the three great groups into which they were divided. How well I remember those terrible names—for I learned them by heart, so that I could repeat them and their meanings over and over again—the *Geophila*, from two Greek words which mean *earth* and *loving*, refering to their terrestrial habits; the *Limnophila*, also from two Greek words which mean *lake* or *pond* [fresh water] and *loving*, owing to the fact that while the former live on the land the latter prefer the shores and mud-flats of, and mud in, fresh water pools, ponds, and lakes; and the *Thalassophila*, or those which love or live in the Greek *thalassa* or the sea,—these being marine. His remarks were confined mostly to the first two groups, more especially to the land snails. He told us: how they lived under rocks, stones, boards, the trunks of fallen trees and beneath their bark, and even amongst the decayed leaves of the ground; how they crawl from their places of concealment and sun themselves, on warm spring days; that there were no distinctions of sex amongst them—both genders being combined within each animal; and that a little after the early spring they begin to lay their eggs, in large numbers, bunched together, and sticking to each other by a mucilaginous substance that also held the bunches to the boards, stones, bark, or leaves under which they were laid; snails' eggs are opaque and white, being longer than broad.

Then we learned that, if the weather were not too damp, the young animals, with complete, though at first small shell, appeared in the gelatinous substance surrounding them, in a very few days after the eggs were laid,—though it generally took nearly a month for them to become fully hatched; that warm weather hastened the hatching process; though the eggs were seldom if ever laid in the snn; that the young hatched themselves, by eating the shell of the egg which inclosed them; that their growth was a rapid one; and that they fed upon vegetable food.

Here the Profeesor stopped to describe the teeth and tongue of snails, and to draw innumerable diagrams of these organs, representative of the different groups, families, and genera of this portion of the molluscous kingdom. In continuing, he said, that there were several species, however, which preferred animal food,—one variety even feeding upon the earth worms while another eat its own eggs. At about the first frost snails hibernate, or in some snug retreat, like that in which it has lived during the summer, goes into regular "winter quarters;" it retires further and further within its shell, forming mucous membrane after mucous membrane as it goes, until there are five to eight or more perhaps;—the functions of thebody move slower and slower, until they at length wholly cease; and that American species, as a rule, are less gregarious than those of other regions. Some species, he said, had no shell or other hard covering whatever, and were then called *slugs*; that these

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Our Premium List Supplement was issued for the purpose of increasing the circulation of our publications, but if you are already a subscriber to either or both of them we will cheerfully fill your order for any article offered therein at prices quoted—should any of these prices seem high you can rest assured that there is either QUALITY or QUANTITY, perhaps both, back of them to fully satisfy the most avaricious collector. Try, and be convinced—remember "Lattin" always "GUARANTEES SATISFACTION."

When you think of the Nickel Plate Road it brings to mind that delightful meal you had in the Dining Car, and the fine service and *Low Rates* and you wonder why people will travel any other way.

From the collections at Chautauqua as advertised in an August issue of the NATURAL SCIENCE NEWS we sold a $600 collection to Mr. A. Hoeffer of Canton, O., and the Mineral Collection we expect to place in one of the large universities of the South.

The Nickel Plate Road runs from Buffalo to Chicago, via Cleveland and Fort Wayne.

When we visit Atlauta we shall be sadly disappointed if we do not find the handiwork of the Brimley Brothers in the North Carolina exhibit; it was through their labors and personal supervision that the exhibit of this state in the Fisheries at the World's Columbian Exposition ranked as one of the best.

The Nickel Plate Road controlls the Dining Stations on its line and they receive unstinted praise.

At the time of sending in their adv. for this week's issue, "The Ebersold Family" make the following very satisfactory statement: "Our business is growing all the time and we find the NATURAL SCIENCE NEWS the *best* advertising medium yet tried."

The Nickel Plate Road runs along the shore of Lake Erie and through Erie, Cleveland, Fostoria and Fort Wayne.

Mr. Kirke B. Mathes has been making exhibits at the State Fairs of Ohio, Michigan, Indiana and Illinois during the past month, Texas State this month, and we are inclined to think that the close of the present month will find him snugly ensconsed in one of the buildings of Atlanta's Great Exposition.

The Nickel Plate Road is the shortest line between Buffalo and Chicago.

A subscriber writes:—"We notice one of your contemporaries is following closely in your steps * * * * * *. In one sense you might consider it a compliment to your genius."—Ye Ed. blushes.

There is no change of cars of any class between New York and Chicago via West Shore and Nickel Plate Roads.

Under a conspicuous caption, "Beware of Pirates," at top of first inside cover page of their mammoth catalogue for '95-'96 Montgomery Ward & Co., of Chicago, who claim to do the largest mail order business in the world, say: "Make a few comparisons the next time you see a catalogue sent out by another house, and if you find any of our quotations or *ideas* copied you may be sure that it is not a safe house to deal with. No honest or reputable house will descend to such practices." It's a question in our mind as to whether this is not "much ado about nothing"—we have had much experience in the furnishing of "ideas" and "schemes" to our admirers (?) but as yet have never taken M. W. & Co's dyspeptic view of the matter.

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One of the busiest Curio Shops in America is conducted by Mr. Ernest H. Short. Collectors are keeping him on the hustle from "early dawn till late at night" and he attributes this aggravating (?) state of affairs almost wholly to advertising in the *Oologist* and NATURAL SCIENCE NEWS.

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" " 1-4	65
Wilson's Plover 1-3	60
Chacalaca 1 4	1 50
Audubon's Caracara, 1-2, data incomplete	1 50
Virginia Rail 1-8	80
Killdeer 1-3	30
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All are *strictly first-class* except where otherwise stated and will be sent prepaid at prices quoted. The few cracked ones are practically as good as 1st class.

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Natural Science News.

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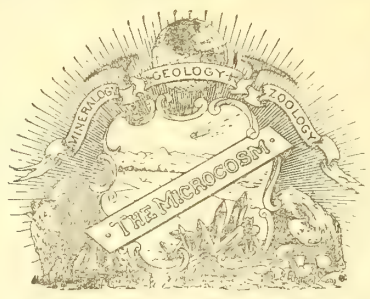

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NATURAL SCIENCE NEWS

VOL. I. No. 37. ALBION, N. Y., OCTOBER 12, 1895. Weekly, $1.00 a Year

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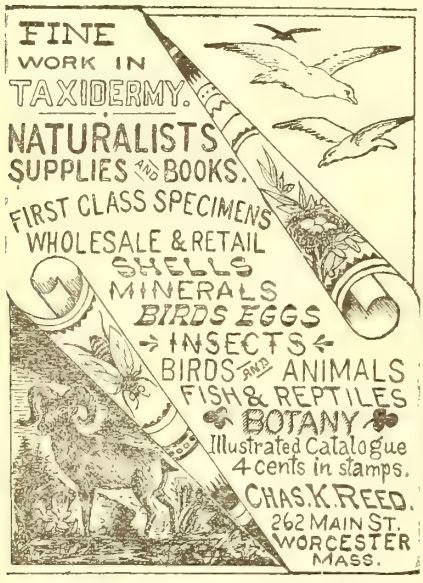
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:05	12:22	4:20	7:40	12:0
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00



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FRANK H. LATTIN, Albion, N. Y.

Natural Science News.

VOL. I ALBION, N. Y., OCTOBER 12, 1895. No. 37

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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The Atlanta Exposition.

The opening of the Cotton States and International Exposition, at Atlanta, Sept. 18, marks a new epoch for the South. To one who misses the deeper significance of it, the display at Piedmont Park is still an exhibition that will excite much praise; but the best of it is lost if we do not look behind the exhibition itself into the origin of the movement that has led up to its accomplishment, and to the spirit that governed the opening exercises.

It is the first ambitious display of the products and resources of the central South. It is the greatest exhibition ever attempted by a city of a hundred thousand people. It was conceived and begun in the midst of a period of profound depression, when people were retrenching, and business enterprises of every sort were drawing in rather than spreading out, for the purpose of calling attention to the real wealth of a country that had suffered drasticly from "fool friends" and from that strange speculative craze known as the "boom." It is the largest and most comprehensive display ever made with the amount of financial resources commanded by the managers. Less than two million of dollars have been expended but so economically and judiciously that nothing attempted has been compelled to stop short of completion.

At the opening, for the first time in the history of the South (unless at a political or religious gathering), men of two races, the Caucasian and the Negro, met in equality on a public platform; and for the first time in the history of great exhibitions, the negroes have been been accorded a special department in which to show the achievments of their race.

The site of the exposition is a singularly fortunate one. Piedmont Park, just on the edge of the city, is some two hundred acres in extent, and much money had already been expended upon it in such a manner as to make it especially adaptable for exhibition purposes. The portion on which the principal buildings of the exhibition are grouped is amphitheatre like in form, so that a view of the whole may be had at a glance from almost any standpoint. In the centre is a little lake, and back from this stretches a small park-like expanse of green verdure, interlined with broad walks and dotted with decorative shrubbery.

At the main entrance, near the Administration building, one may stand and look down into this little vale, and on to the lake, and still across to the buildings on the further side, and witness a most pleasing and busy scene. As is customary with great undertakings of this sort, the opening came rather too soon for most of the exhibitors, and indeed for some of the builders. The construction of the main building is pretty well completed, but painters and finishers are still busy, and the sound of the hammer and the saw rings constantly on the air. Many of the smaller buildings, such as those of the individual States, are just in process of erection. In but one or two of the principal structures are the exhibits all in place, and "No Admittance" was the signs on many of the doors on the day of the opening.

Over in the "Midway," which is called by some other name, but which will still be the "Midway," to all who witnessed the aggregation of wonders and commonplaces that were grouped under that name at Chicago, there is as yet little but the bare buildings. I went into the Mexican Village, and found perhaps a hundred Mexican men and women, seated at long board tables in a newly-erected shanty, breakfasting with much noise and merriment. A single booth was open, in which a few native figurines were displayed; an arena, for the exhibition of feats of riding, was about completed; and outside was a modest sign, "Admission today, ten cents." Certainly that was as much as it was worth.

The Fine Arts building, which is the handsomest structure on the grounds, being of classic design, and finished with white staff, thus giving an echo of the Columbian Exhibition, was almost completed and ready for opening—almost, but not quite. The pictures were all hung, and the interior was clean and cool. Some workmen were yet busy setting statuary in place, while others were placing the railing that was to protect the art treasures from the too inquisitive hands and canes and umbrellas of occasional vandals.

The building is well arranged and lighted, and the walls are well covered with pictures, hung rather heterogeneously. Some good pictures are there, and some very ambitious canvasses. As is to be expected, the South is well represented, and we have to conclude that the judges were sometimes governed by sectional sentiment rather than by artistic discernment.

A little way from this building the Plant System, the great railway and steamship company of Florida, has a unique display. This consists of a building, in the shape of a pyramid, a hundred feet square at the base and fifty feet high. It is covered with broken rock phosphate, and shines white and clear in the brilliant sun. Inside is grouped what is perhaps the best display of Florida products and resources that has ever been made. It will be remembered that at Chicago the Florida display was a dismal failure. Notwithstanding the reverses the State has since suffered, it has come forward here most brilliantly. In this building, and in the agricultural as well, it has much that will interest both the casual visitor and the prospecting home-seeker—not tropical fruits alone, but the grains and woods and phosphates, wines, tobacco and curious things from the land and the sea. The effort seems apparent to show that Florida is capable of producing something of value besides the orange, and thus to convince people that it is not a State of a single resource. This is a movement in the right direction; for, so long as a State or section is dependent up-

on a single product, reverses will come that will bring almost unendurable hardships and disasters. Grain-growing and cotton-growing and sugar-growing and orange-growing districts are all finding this to be true, and in general are working toward a greater diversity of products.

Among items that are specially worth mentioning in the Florida exhibits are the pine-apples, showing the excellent results that have been achieved in their culture upon the east coast of the State. about the foot of the Indian River. and at Palm Beach. Bananas and cocoanuts are also shown from the same section, and this is about the only bit of all our vast country that is sufficiently tropical to produce these three things. Guavas, alligator pears and tropical pawaws are among the curious fruits. Sisal, hemp and other fibres are shown; curious goods made by the Seminole Indians, down in the depths of the everglades, from feathers and shells and bark. Preserved fruits and jellies are abundant, the famous guava jelly leading them all. Hats, baskets, fans and fancy work made from plametto,and from the cocoanut cloth that grows in sheets about the trunks of the cocoanut trees, attract attention.—*J. K. R. in The Cultivator & Country Gentleman.*

The Dismal Swamp and its Occupants.

"I have just returned from a visit to the Dismal Swamp," said Dr. A. K. Fisher, ornithologist of the Department of Agriculture, in Washington, the other day. "It is a strange region, full of oddities that are not to be found elsewhere. The purpose of my expedition was to investigate the fauna of the locality, and of rare mammals and birds I secured quite a number. Snakes are abundant and are alleged by the natives to be venomous, but all that I saw were harmless. When I picked up a good-sized one from a log and held him by the neck, the negro who was paddling for me shuddered so he nearly upset the boat.

"I found about fifty species of birds breeding in the swawp. One of them was Swainson's Warbler, which is very rare. I trapped several species of small mice—rice mice, field mice, golden mice and lemming mice. The lemming mouse is hard to catch, because it will not take any sort of bait. The only way to capture it is to set a trap in its runway. I set my traps in dry places out of water. Among other things I got two rare shrews.

"There are plenty of cattle in the swamp—small, dark and very wild. They are the progeny of animals that have strayed from domesticated herds. Hunters stalk and shoot them like deer. Bears are numerous. In the autumn they feed greedily on the fruit of the sour gum. Wildcats, opossums and raccoons are not scarce, while squirrels are remarkably abundant. The squirrels have discovered an easy way to get a living by going along the shores of Lake Drummond and picking up the nuts and berries which have fallen into the water and drifted in windrows. They trot along the logs and fish them out with their paws. Deer are common but hard to get. In the fall hunters run them into the lake and catch them with dogs.

"There is fine fishing in Lake Drummond, which contains plenty of perch, black bass, two kinds of pickerel, three species of sunfish and other panfish. There is no dry ground in the swamp, and one sinks at every step to his knees in mud. The cane which forms brakes all through the South is abundant. Together with a varied undergrowth, it is tangled with vines that run up into the trees, so that half a mile an hour is a good rate of progress. One must carry a knife to cut the vines, walking being further impeded by the cat brier, whose thorns catch in the clothing and hold on like hooks.

"The boats used in the Dismal Swamp are all dugouts, made from cypress logs, twelve feet long and very narrow. To shape such a craft properly is a nice piece of work. The novice who steps into one of these boats is apt to go out on the other side, but the native stands up and paddles with security. The water is darker than amber and excellent to drink; it is said to be a sure cure for malaria. There are no malarial diseases in the swamp. The swamp is full of magnolias, from the size of bushes to trees sixty feet high.

"When I was there they were full of flowers. The cypress trees are cut for shingles. The best trees for the purpose are those which fell from twenty-five to fifty years ago, and are now covered with moss. The negroes wade in and cut off the moss and rotten bark. Then they cut up the log into shingles on the spot. The next best tree is one that is newly fallen, and the third quality is the tree that has to be felled."—*Philadelphia Telegraph.*

Preparation of Parasitic Worms for Microscopical Examination.

The following are the chief methods in use at the University of Nebraska for the preparation of parasitic worms for examination by the microscope.

The worms may be examined microscopically either when alive or after being killed and preserved in alcohol. The examination of the living worm is the easier, and often the more satisfactory method and is as follows. After the worms have been washed free from slime, etc. they are placed in a weak solution of common salt, which solution has the strength of .75 of one per cent of salt. This is known as "normal" or "physiological" salt solution. It may be made up approximately by adding a level teaspoonful and a half of salt to a quart of rain water. The parasites will live in this solution for several hours, especially if it is kept at nearly a blood heat.

Now take one of the worms and place it on a microscopic slide and cover it with a piece of thin glass (best use "cover glasses" obtained from opticians) and add just enough of the salt solution to fill the space between the two pieces of glass. Now, in a few minutes the specimen will be transparent enough to be examined with a microscope and the anatomy clearly made out. Be careful to add water to supply evaporation, during examination. With some tape worm proylottids it may be necessary to place them between two slides, for examimation, and even to compress by means of a small rubber band.

Now as to other methods: Parasites may be taken from normal salt solution and preserved according to directions given in NATURAL SCIENCE NEWS for March 2d. Having specimens thus treated and in 70 per cent alcohol we will proceed: The first steps are to get them ready to stain and to stain. For staining we use either borax carmine, or czokors alumn cochineal. Gradually add water to the alcohol containing the specimens or transfer them at intervals of 5-10 minutes to 50 per cent,then to 30 per cent alcohol, then to pure

water. Now, to stain, place in czokors cochineal for 5 10 minutes, or in borax carmine for 15-30 minutes then transfer to one-fifth per cent solution of Hydrochloric acid for a few minutes or until the color commences to fade. Then wash or rinse in water; place in 30 per cent alcohol for 15 minutes; 50 per cent alcohol for 20 minutes; 70 per cent alcohol for at least 20 minutes and then into 95 per cent alcohol for at least one hour. This is to extract the water from the specimens. The next step is to replace all the water and alcohol by some fluid which will produce a clear mixture with Canada Balsam. Such a "clearing" fluid may be made up of three parts spirits of turpentine and one part of pure carbolic acid. The specimens must soak in this till they become transparent and clear. They are then placed on a slide, a drop or two of balsam added, and covered by a cover glass of suitable size. Your specimen is then ready for examination, and as soon as the balsam hardens it may be labeled and put away as a permanent preparation. If the specimen is not perfectly transparent it must be placed back in the 95 per cent alcohol for a few hours and then again soaked in the turpentine clearing solution till transparent.

It may be necessary to compress thick specimens between two slips of glass, and confine by a rubber band while being carried up through the alcohol series.

Some Nematodes may be soaked in pure glycerine for a few days and then mounted in glycerine jelly.

Recipes:

Borax Carmine. Carmine, one gram; borax, four grams; distilled water, 100 cubic centimeters. Mix and allow to stand for 24 hours. To this solution add 100 cubic centimeters of 70 per cent alcohol. Allow to stand and use the clear fluid.

Czokors Alum Cochineal Take seven parts of burnt alum and seven parts of finely powdered cochineal and boil in 700 parts of distilled water till only 400 parts of the solution remain. Add enough carbolic acid to give a distinct odor and filter two or three times. At the end of six months add a little more carbolic acid and refilter.

Canada Balsam. This is the clearest grade of Fir balsam and it may be used in the form obtained from the drug stores, but is better if treated as follows: Evaporate over a water bath until the residue is hard on cooling. Dissolve this in benzol, or xylol, until the solution is about as thick as ordinary "sugar drip" sirup. Keep in a tightly corked bottle.

WILL C. HALL.
Creston, Ia.

How I Became a Conchologist.

"Here are a lot of shells from Labrador," said my teacher, turning out a very miscellaneous assortment which had just been sent in by some explorer. Separate them into two groups, putting all that have one valve into a box, and all that have two into another." I proceeded to divide them as directed, for I could count as high as two at least, and that, with the use of my eyes, was all that was necessary for my first lesson in conchology.

"Now take those in the first box and compare them with one another. Count how many turns each one makes from the point to opening." So I began to compare them and soon found that they were all made on the same general plan, with many varieties; that each had a spire composed of more or fewer whorls, and an aperture either round or elongated into a canal.

After this my teacher recommended me to study "Woodward's Manual," which I did with much interest and profit. How well I remember the figure of *Strombus*, with which I began, and how I learned to search for the notch in the outer lip, near the canal. To this day the discovery of that feature in a shell gives me a peculiar satisfaction. Then came *Pteroceras* with horns, and the spiny *Murex*, and *Rostellaria* from the Red Sea, all of which became as well known as the faces of the college boys who sat around the table at my boarding-place.

My progress was not rapid, and when it came to sub-genera, and synonyms, and modern innovations my anger was kindled, and I longed for something that was fixed and definite. I had not learned that a living and growing science is better than one that is supposed to be settled and finished. Nature has enough that is certain for the beginner, and plenty that is doubtful for the investigator.

All this happened in Amherst College, where I was taking a post-graduate course, especially for the study of geology. My wise teacher, Professor Emerson, saw that to understand fossils I must first study modern shells, and therefore he gave me the lessons that I have just described. I had often admired the great collection of shells in the college cabinets, and now I was learning how to understand them. A large duplicate collection had been accumulating for years, and as soon as I was able to do it my teacher set me to arranging them in proper order. My interest in geology did not die, but my love for conchology increased, and when I came to California soon afterward, I began to collect shells for myself. By the help of scientific friends and museum collections I was enabled to learn their names. As there was no popular book to describe them for beginners, I wrote a little one, and afterward a large book, entitled "West Coast Shells." Most of this work has been done during the spare hours of a busy life. The path is an open one; may many of the readers of the *Outdoor World* enter it, and find in the study of these beautiful works of the Creator an ever-increasing source of profitable investigation and ennobling pleasure.—*By Prof. Josiah Keep in The Observer.*

Can Cats Count?

A friend has several cats which have been taught to make their homes in a barn. One of the workmen in the establishment has been for a number of years in the habit of bringing food from his house, after every dinner time, for these cats. A remarkable fact is that they go from the barn to the entrance of the gate property always about fifteen or twenty minutes before the workman makes his appearance. Just how they come to learn this exact time of day is not clear, although it goes to show that these animals have reason and judgment to some extent. Strange to say that although this has been going on for several years, the cats do not seem to know that every seventh day is Sunday, and that the workman does not make his appearance at the grounds on that day, yet regularly every Sunday, for all these many years, they come to meet him, only to be doomed to disappointment. It would seem from this that cats have not the power to count, or they surely would be able to know by this time that there is a seventh day when they would be doomed to disappointment in their daily meal.—*Mechans' Monthly for October.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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were nocturnal in their habits, and committed extensive injury to gardens, which they are fond of inhabiting; that *slugs* do *not* hibernate, though they become torpid.

This, however, formed but a small portion of a single lecture: yet is there not here, even, abundance of food for thought and incentive to search still further into the mysteries of Nature?

Professor Morse is, evidently, an ardent evolutionist; yet in spite of his natural inclination to protract his lectures into some abstruse features of evolution, or of Darwinianism, there is always much valuable information in them that is carefully noted and remembered by every person present. Sometimes he tells us about that most wonderfully curious appendage of the bivalves or lamellibranchs, the crystalline style, and of how it has no attachment to the body,—this leads to an investigation, and our discoveries are marvelous.

One of his talks is devoted to *pearls*, and we learn that pearls are formed by the retention by the mantle of foreign particles, the irritation of which causes a pouring out of the secretions of its body substances—*thus pearls grow*. But while we are jotting this down, we hear the equally surprising fact that, though with the majority of shells both sexes are combined in the same animal, with the *Unios*, or fresh-water bivalve shells, the sexes are distinct and comprised in different individuals;—but he failed to tell us how generally, or in what special families, this bisexual arrangment exists throughout the molluscous kingdom—this, then, would be a capital point for investigation for some enthusiastic naturalist or specialist in this department, for I do not believe that it has ever been fully or accurately determined.

At still another time we learn that the shell itself does not obtain its color from the color of the food which the animal eats, as many formerly supposed. Of many samples given, the Professor laid particular emphasis upon that of the *munera*, which eat green food and yet had a red shell. It is with such information as has been given above that we fill our note books and our heads,—we cannot take down all that he tells us, much as we would like to do so; there might be a few favored individuals present to whom the mysteries of shorthand or takegraphy would reward their possessors with all the words and ideas of our Professor; but *we* an editorial we, applying to nearly everyone of us in the room, are not so far advanced in this peculiar branch of education but that our notes embrace but a small part of the hour's discourse, no matter how diligently we may struggle with pen and pencil and abbreviated English. You will doubtless smile as you read a page of my original notes—corrected simply as to its language:

"There is no muscular movement in the opening of the valves of a bivalve shell, but simply in its closing; in the one case the ligaments, contracting, push the shell open, in the other it pulls it from the inside. Lines of growth upon a shell indicate its age. The muscles of the margin of a bivalve shell are to enable the animal to draw in its mantle. To preserve molluscs, first kill the animals by immersing salt-water species in fresh water and *vice versa*, and then place in alcohol. In dissecting such animals, dissect under water, or water in which a small quantity only of alcohol has been put; if intervals occur during the work, replace the specimen in alcohol. What is ciliary motion? Ciliary motion ten foot square would exert a force equal to ten tons. It is ciliary motion that induces a current, and brings the food within reach of the palpi (or small *feelers*, as they are sometimes called), which act freely at a short distance only from the mouth; these *feelers* secure the food, mould it into pellets, and convey it to the mouth."

At this point, in one of our lectures, sometime yet before the close of the hour, one of the men brought in a huge skate fish and lay it upon our table. All exercises were postponed, in perfect good nature, while Professor Putnam explained to us the difference between it and an immense sand-shark, over which one of the scholars was just then working. He told us, that the sharp tubercles of the skate were identical with the small, rough ones of the shark;that the skate was higher in its position in the class than the shark, as its embryo passes through the form of shark before becoming an adult skate; that if one were to flatten a shark they would obtain the general appearance, in form, of the skate; a fish having spiracles, indicates that it lives near the bottom of the water; that neither the shark nor the skate possessed scales, and were, therefore, of a different order from that of the majority of fishes; and that the character and structure of the scales of fishes determined. to a large extent, the relative position not only of whole groups of fishes, but even of many individuals in each group.

Later, in the same day, Professor Packard added largely to our stock of information. Many of us had sought to study up the subject of Animalculæ, in fact all of us were more or less interested in it; and forthwith, jars, bottles, and dishes of various sorts were filled with water, and large quantities of the very best material that could be obtained, for breeding and keeping them. Our hitherto rusty microscopes now fairly gleamed, in expectation of the marvels soon to be laid open, through them, to our wondering gaze. Professor Packard knew all about such things. He told us to "search in fresh water, rain water, water abounding in mosses, and marine pools for our subjects of study and investigation." Somebody brought in to us specimens of worms and small parasitic crustaceans,—and of where and how to find others and how to preserve them, he told us: "You will find them in dissecting fishes and reptiles, in nearly every portion of the body and in the viscera; tape and sundry specimens of minute worms and flukes are found *in* the body. Place them at first in weak and then transfer them to strong alcohol. A species of round worm inhabits the flesh and muscles of certain fishes. With the more common species of salt water worms, allow them first to die in fresh water, and then preserve like the others. One species floats upon the surface of the ocean, when it is calm. The best time to collect such specimens is from sunset to nine or ten o'clock at night," etc. But it is quite impossible to put upon paper all the notes which we collect for our note books; yet we hunt everywhere,—we fill bottles and jars, and our tables, shelves, and the floor, even, is filled with them: specimens, specimens, specimens, EVERYWHERE. Our professors lecture to us of nothing else; our time is spent in securing and dissecting them,—yet the more we learn the more there seems to be to learn about them.

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Our Premium List Supplement was issued for the purpose of increasing the circulation of our publications, but if you are already a subscriber to either or both of them we will cheerfully fill your order for any article offered therein at prices quoted—should any of these prices seem high you can rest assured that there is either QUALITY or QUANTITY, perhaps both, back of them to fully satisfy the most avaricious collector. Try, and be convinced—remember "Lattin" always "GUARANTEES SATISFACTION."

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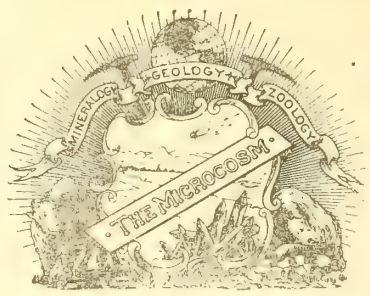

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NATURAL SCIENCE NEWS

VOL. I. No. 38. ALBION, N. Y., OCTOBER 19, 1895. Weekly, $1.00 a Year

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Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20	12:35	
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45	
Buffalo.....	8:55	10:55	1:25	5:15	8:45		

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Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
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FRANK H. LATTIN, Albion, N. Y.

ERNEST H. SHORT, ALBION, N. Y.

Natural Science News.

VOL. I ALBION, N. Y., OCTOBER 19, 1895. No. 38

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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At the Atlanta Exposition.

Perhaps it is not quite fair to the general purpose of the exposition to give the display made by the general government great prominence. But there are two reasons why I am inclined to do so. First, the government gave liberally—$200,000. True, this has gone wholly into a building for housing the special display of the government. But this is of the widest interest and greatest educational value. Second, while the displays which particularly illustrate the South will be of most interest to northern visitors, the people of the South itself will with difficulty find anything more engrossing and stimulating than this exhibit of the functions and administrative faculties of the general government. Many of those who visit the Atlanta fair will be from the interior, and from districts more or less remote. They did not, to any large extent, have the opportunity of visiting the exposition at Chicago, and Washington is almost unknown to them. Many of them have never been at the sea. Laboring under disadvantages of remoteness and lack of means for travel, they have seen little of those things which help toward the broader knowledge of life and of the world. To such the display made in the government building will prove a boon and an educator. Whether it is the miniature light-house, the operations of the life-saving service, the daily forecasting of the weather, or the curious displays of foreign stamps made by the postal department, or the letters from foreign potentates, with their profuse expressions of regard for our own political head; or the maps which show the progress of our territorial extension; or the portraits of the presidents and secretaries from the beginning of our national existence down to the present time—all these help toward an understanding of the power and extent of our country.

But it is in the department of agriculture that we may look for the things that will particularly interest the readers of the *Country Gentleman*. Here are the instruments and maps the weather makers use. Close by is a collection of models illusrrating both poisonous and edible mushroons. A collection of native grasses, particularly those of the southern states, in sheaves, gives evidence that grass can be grown in the South. Weeds of economic importance, and weeds that are always "plants out of place," are also shown in such manner that they may be easily studied. And for boys who wish to gain some practical knowledge of botany, and to make collections of plants about their own homes, outfits used by the professional collector; and in preparing plants for the herbarium, may be seen.

The Bureau of Animal Industry, by specimens and photographs, illustrates the ravages of diseases among our domestic animals, and a complete set of the publications of the Department of Agriculture help us to an understanding of the great amount of information that has been collected and distributed, for the benefit of the agricultural interests of the United States. Birds, mammals and insects that are injurious to agriculture are bere shown in their true colors, so that all may become acquainted with them. Fibres that can be grown in the United States, both those of accepted value and others which are as yet only experimental here, are displayed, together with exhibits of the products manufactured from them. Diseases of plants, and the methods used to combat them, will attract the attention of the horticulturists, as will also the exhibits in the division of pomology, among which I would call special attention to the fresh fruit preserved in carbon dioxide (carbonic acid gas, CO_2).

I can safely recommend all classes to give abundant time to the display under the charge of the Smithsonian Institution. The purpose is to convey to the minds of those who see it an impression similar to that which they would receive if they visited the Smithsonian buildings in Washington. It illustrates every phase of the activities of the Smithsonian, and particularly of the wonderful and comprehensive National Museum. One of the first things to catch the eye is a map, 10 by 20 feet, showing the geographical distribution of the correspondents of the institution, who are 24,000 in number, and who reach into every corner of the world.

In the department of mammals are 43 specimens, illustrating the range of forms in the class of mammals, and in a general way the manner of their classifications by naturalists.

Of still greater interest is a series of costumed figures which illustrate the physical characters and ethnical costumes of twelve of the most characteristic types of the human species. The figures are in sculptor's plaster, modeled either from life or from the abundant materials in the museum, and the costumes have been collected by correspondents and explorers for the institution. The types are: The Papaun, from New Guinea, with costume of a feather plume, ear-rings and nose-pin, anklets of shell disks with a pendant boar's tusk, armlets and wristlets of shell, and a waist-belt of bark; the Australian, who carries the boomerang, and is clothed in a scant apron of kangaroo skin; the Zulu from Southeast Africa, who carries an assegal, and wears an apron of cow tails—and nothing more.

The above are of the black types. Next come the brown red men—the American Indian from Peru, wearing an apron made from the brilliant plumage of tropical birds, and with ornaments of beetle wings, seeds and the teeth of monkeys and pumas; the Dyak, from Borneo, wearing a Malay *sarong*, and carrying a spear and shield ornamented with tufts of human hair, and the curious serpentine dagger known as the *creese*; the Maori of New Zealand, one of the most perfect types of physical beauty, and one which is now on the verge of becoming extinct. The costume is a robe of New

Zealand flax, with a shoulder-cape of feathers, and the sceptre of a chief is held in both hands.

The yellow types are next—the Eskimo, with costume of reindeer skin, and gloves from the fur of the polar bear; the Tibetan, from Eastern Tibet, with a woolen robe and boots of native manufacture; and the Siamese, with a complete costume of native fabrics, presented to the institution by the King of Siam.

The white types are the Arab sheik, with woolen robe or *burnoose*, turban of camel's hair, cord, etc., the whole being the gift of the Trocadero Museum: the Armenian, with turban, embroidered coat and trousers, and robe of blue silk, shot with gold; and the Berber from North Africa, in native cotton garments, and carrying a long and vicious-looking gun.—*J. K. R., in Country Gentleman.*

Some of the Uses of Shells.

Among the various contributions that nature makes to the wants of man, shells figure quite extensively. As vessels for food and drink and other domestic purposes, many species are very conveniently shaped. The valves of many species of clams are large and deep and available for cups and dishes, and as such have been used by the American Indians, who have also employed them as knives, scrapers and hoes. Shells of the genus *Unio* have always held an important place in the domestic and mechanical arts of the savages of North America. The valves of many varieties of these shells are well adapted to the use of man. Although not large enough for food vessels, they make very satisfactory spoons and cups; but it is probable that they were much more frequently used by the Indians as knives and scrapers. The very widely distributed *Pectens*, on account of their beauty of form and color, have been in great favor with all peoples. They were extensively employed by the ancient inhabitants of America as ornaments and rattles, and many specimens obtained from graves and mounds appear to have been used as utensils, paint cups and vessels for food and drink.

The *Haliotis* affords an excellent example of the varied uses to which the natural shell has been applied by savage peoples. Explorations of the burial places of the ancient tribes of the Pacific coast have brought to light numerous specimens of these shells, which had apparently served as bowls, dishes and spoons. This shell probably formed as important a factor in the commerce of these tribes as did the large conchs of the Atlantic coast in that of the mound builders and their neighbors. The rougher and more homely oyster shell enjoyed the favor of the mound-building tribes, and probably served many useful purposes. Many species of the *Fissurella* and *Dentalium* shells were in common use, advantage being taken of the natural perforations for stringing, the latter being quite extensively used for money on the Pacific coast.

A great variety of the larger univalve sea shells have been used in the unaltered state, the *Busycons* probably taking the most important place, and species of the *Strombus*, the *Cassis*, the *Nautilus*, and *Fasciolaria* following in about the order named. The *Busycon perversum* has been more extensively employed than any other shell, and the uses to which it was put by the ancient Americans were numerous and varied. Fine specimens of vessels made of this shell are on exhibition in the National Museum at Washington. As domestic utensils, bivalve shells have held a place hardly inferior in importance to that of the large univalves. Marine and fluviatile varieties have been used indiscriminately, and generally in the natural state; but occasionally altered by art to enhance their beauty or add to their convenience. Such alteration consisted chiefly in the carving out of a kind of handle to form a spoon. It is curious fact that most of such utensils that have been met with have been made from the left valve of the shell, which gives such a position to the handle that they were most conveniently used by the right hand, thus indicating righthandedness on the part of their manufacturers and users.

According to Pictet, large shells called tritons were used in ancient times as vessels for offering libations with.

Rondelot, speaking of the *Olearia*, says that goldsmiths make very elegant ewers of this shell by adding a foot and handle to it, and that some regard these vessels as a preservative against poisons.

In the cottages of Shetland, the *Fusus antiquus* is suspended horizontally and used as a lamp, the oil being placed in the cavity of the shell and the wick passing through the canal.

Patelidæ, in the vicinity of Cancale, serve as an oil reservoir in small lamps called "crassets."

The common mussel and a few other shells are called artists' shells, from artists' colors being put in them.

Saint James shells, a species of *Pecten*, are freuquently used in Brittany as milk ladles and drinking vessels.

According to Pliny, the round cockles were used for measuring oil.

In China, certain *Tridacnæ* are used as watering troughs for cattle and some of the wealthy mandarins possess baths made of a species of this shell. A pair of valves of *T. gigas*, weighing upward of 500 pounds and measuring about two feet across, are used as holy water basins in the church of St. Sulpice, Paris. They were obtained from Francis I, to whom they bad been sent by the Republic of Venice.

In several countries of the Indies windows are glazed with transparent shells cut into square. The species used for this purpose is *Placuna vitrea*, or "window shell." All the churches of Goa still have their windows glazed with this shell. De Guignes states that the same use of the *Placuna* is made in China.

We meet with numerous examples of the use of shells as instruments of war, hunting, labor, and construction. Drake tells us that some of the South American tribes had hatchets and knives made of shells that often reached a foot in length. These were carved and polished with art, and must have lasted a long time.

In New Caledonia, flat axes are made of shells of large size and round form.

The shells of the genus *Tridacnæ* are quite thick, but their edge is thin enough to allow the Polynesians to make picks, axes, and other instruments of the kind out of them. The Indians of Florida made their tomahawks out of the shell *Busycon perversum*.

Among the Fuegians, the only native tool is a large shell of a sea mussel, carved and sharpened and firmly affixed by a seal skin strap to a stone designed to be held in the hand.

The Indians of Vancouver's Island still carve their wooden sepulchral images with knives made of shells.

Celts made of *Strombus* and *Busycon* shells have been found in var-

ious parts of America. These are polished like the similar instruments made of stone. These implements are frequently mentioned by early writers. Wood, speaking of the Indians of New England, says that their canoes were made of pine trees, which, before they were acquainted with English tools, they burned hollow and scraped smooth with clam and oyster shells. The great majority of scraping implements obtained from the mounds, graves, and shell heaps of the Indians are simply valves of *Unio* or clam shells, unaltered except by use.

The first explorers of the Atlantic coast found many of the tribes tilling the soil with unworked shells lashed to rude handles, the shell most frequently used being that of the clam.

The use of shell in the manufacture of fishing implements seems to have been almost unknown on the Atlantic coast, but hooks of shell are very plentiful in the burial places of the Pacific coast, and are frequently so well shaped as to excite admiration.

Among the Caradjis of Australia, and several other peoples, a sharp shell is used for tattooing.

The Indian chief Powhatan tortured his enemies with the shell of a mollusk, and his wives made use of the same kind of implement for cutting their hair.

The Indians of Florida used the shell of the *Busycon* as a club head in the manufacture of their cassetetes.

A rather novel use of shells by the Indians is mentioned by early writers. The two valves of the small mussels or clams were made to do service as tweezers for pulling out hair.

The spiral column of certain univalve shells was used by the Indians for making pins. Some of these were pointed at both ends, while others had heads like the pins of civilized people. The exact uses to which these objects were applied are unknown. The favorite idea archæologists seems to be that they were hairpins, used by the savages to dress and ornament their hair.

Shells were largely used by the American Indians for the manufacture of articles of personal adornment, such as beads and gorgets for money.

The Friendly Islander wears the orange cowry as a mark of chieftainship. Another cowry is used by the Asiatic islanders to adorn their dress, to weight their fishing nets, and as a medium for barter. The New Zealander polishes the *Elenchus* into an ornament more brilliant than the pearl eardrops of classical or modern times.

Shells, especially of the large species of *Buccinum*, have been quite frequently used as musical or calling instruments. In antiquity, the name of the war trumpet was that of the *Buccinum*, which had been used from the remotest times.

The Polynesians use a sort of marine trumpet made of the shell of a huge mussel.

The Corsican mountaineers, in their wars with the Genevese, used a marine shell as a horn. On all the islands of the Pacific the *Triton* is the conch blown as the signal of war. The *Lambis* serves as a hunting horn to several savage nations.

Throughout Province, principally during harvest time, horns made of *Buccinum undatum* are used for calling the laborers to work and also for corresponding to great distances by means of sounds previously agreed upon. Upon the seacoast of Upper Brittany large whelk shells are used for the same purpose.

Shells were among the number of musical instruments of the Peruvians. They were also used by the Mexican priests in their religious ceremonies.

The chank shell (*Turbinella pyrum*) is carved by the Cingalese, and several varieties of it, from which the priests administer medicine, are held sacred.

The valves of *Anodonta escula* are used as skimmers in Brazil, and the shells of an *Ampullaria* serve to dip up caoutchouc gum.

The mussel shell has a few applications. When polished, it is made into needle books, scent bottle holders, earrings, pincushions, etc.

Some of the cockle shells are made into pincushions, and the shell-flower maker uses them to form the hop and other imitations. Common, cheap pincushions, are made of the whelk and many other shells.

Large quantities of small shells enter into trade use for making shell flowers and different articles of shell work.

The shells chiefly used for imitation flowers are parts of the valves of barnacles, *Dentalium, Oliva, Marginella, Strigella, Pholas, Cardium, etc.*

Of late, among the curious uses to which the *Turbo* and some other shells have been put in Europe is for pipe bowls.

The shell of a species of *Mitra* is used for the same purpose by the inhabitants of the Banshee group.

The shell of the pearly nautilus is made into a drinking cup by the inhabitants of the East, and that of the *N. Pompilius* is often mounted on a stand in Europe and used for holding flowers.

The shell of an *Anodonta* is used for the bridge of musical instruments by the Mittoo tribe in Africa, and round fragments of the shell are used by them for gambling purposes.

In Japan, the ladies play a game with the valves of shells with designs painted upon them.

The "green snail" of the dearers (*Turbo olearius*) is very largely used for ornamental purposes. Slices of the shell ground down to a thin surface are employed for inlaying various articles. Buttons, earrings, and other objects are made of it, and also very pretty ornamental stands that open with a spring and inclose scent bottles, etc. Of late years handsome sections obtained from this shell have been largely used for ornamental buckles for hats, shoes, and belts.

Fine, large shells of this species formed the drinking goblets of the Scandinavian monarchs, and are often still met with, very elegantly mounted and set in jewels.

Another shell of this genus, the Turk's cap, from the west coast of Africa, is used for making small articles, such as caskets, scent bottle holders, brooches, etc.—*Sci. Am.*

What is an Insect?

Many who have not studied the subject of entomology would think spiders, scorpions, centipedes and such to be insects, but the following article which I take from Rev. J. G. Wood's beautiful work on "Insects at Home" will convince him of his mistake.

"Insects are technically described as being articulated animals, breathing by tracheae, divided into three distinct portions—viz, the head, the thorax and the abdomen—passing through a series of transformations, and having in the perfect or "winged" state six articulated legs and two antennae.

It would be advisable for every body interested in Natural History to bear these few facts in mind, so as he may be able to give a short and correct answer should the question be brought before him.

HERMANN SCHWARZ,
St. Louis, Mo.

PENIKESE—A Reminiscence.

By One of its Pupils.

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LECTURES: AGASSIZ.

It is from such sketches of our lectures as those just given, that the reader will obtain a glimpse, faint and imperfect though it may be, of a single day's doings at Penikese. The *crumbs* that have been garnered thus for your benefit, would form but a part, and a small part at that, of a single day's work. On an average, four lectures a day and often a fifth in the evening, besides laboratory and field work, form our regular daily task; then we write our notes out in the evening. Do you wonder where our time for rest comes in? We have none—our work is rest; and yet there is not one of us who does not enter into all this willingly. A certain President of Amherst College once asked the late Professor Charles U. Shepard, the well-known mineralogist, what he considered the "three most important elements of success to the young man during his college course." The Professor replied, without an instant's hesitation, "the *first* is work!" Then with a pause of several moments, he continued, "and the *second* is WORK!" and again pausing, as if to impress his hearer with its importance, "and the *third*," here a much longer pause than any of the others even, "is WORK!" and he emphasized the word with all his power. Whether borrowed or not, the phrase contained then, as it does now; the *only* solution to the question. This is what we did at Penikese Island.

The lectures of Professor Agassiz are so individualized in character that they may very properly form a distinctive feature of this little sketch of our school. There are, no doubt, flaws in the matter, which is here presented as "notes" only,—but if such occur, they will doubtless be due, more to the youth and inexperience of the pupil who took them down than to the possibility of mistake on the part of the lecturer; but such as they are we give them to the reader.

Professor Agassiz's first lecture was made up of somewhat disconnected suggestions as to the manner in which we should go to work to study the material to be found at hand, about and around us, upon the island. He said:—

"I would call your attention first to the soil and geological formation of our island. Points of compass are a very essential feature in geological formation. We find that the *barracks* lie nearly east and west. You will then find that the islands are cut into by numerous bays, necks of land, etc., and the question arises how are these formed? Then you must find out all about the rocks, their connection with the island and their connection with each other: the difference in the material beyond the rocks and beneath them; the difference of soil; and then how the whole resemble those of the adjoining islands. Find if there be any evidence of these islands ever having been connected. In our investigations we must deal with facts of Nature—this teacnes us always to submit to truth.

"Now let us turn our attention to the jelly fishes, barnacles, fishes, etc., which will form our chief study here. Do not handle *any* specimen more than is absolutely necessary, you never know to what extent you have injured it. Put your jelly fishes into pails of water by floating them from the net to the pail. A word more about our rocks; each one must collect specimens for themselves. There will be found, probably, upon our island, three-fourths or even nine-tenths of all kinds of rocks in the United States."

At another time he again took up the subject and said:

"Most all of the rocks upon our island are imbedded rocks, not rocks in place. Some of the neighboring islands show rocks in place. Our first question, upon seeing them is, Where did they come from? The mineral foundation of our earth is alike everywhere. This was first shown by Humboldt. When you find a rock *not* in position, hunt for one of the same kind *in* position,—then search for specimens between the two localities, and, if possible, trace their connection. Loose materials are called *erratic*, or bowlders, etc.; the whole bulk is called *drift*; ledges and the like are called *rocks in place*. Our island probably contains specimens of all of our rocks, excepting those of volcanic origin. Your specimens should all be broken afresh, upon all sides, so that they may be more accurately studied. Rocks found near the water are usually assorted (those of a size being together), the larger ones lying higher up than the small ones. On hills and away from the agency of water, they are mixed; the small and the great lying together. By this means we recognize the two agencies that are at work depositing them."

The third lecture was devoted chiefly to hints upon how to study the jelly fishes, and was illustrated by numerous diagrams. Toward the end he digressed from his subject to give us a few remarks upon fishes,—especially regarding the *Scup*, a specimen of which, recently taken, someone had brought to him. Of it he said: "The Scup is not found north of Cape Cod, neither is it found extensively in Southern waters. The American coast does not furnish many species of this family, though they are common in the Mediterrean and are called *Sparoids*." He then gave us the names of the fins and facial bones of fishes. Professor Agassiz was always careful as to the books which he recommended for our perusal. Upon the jelly fishes he noticed but two; Professor Almon's "Monograph of English Jelly Fishes," and Edward Forbes' "Medusæ."

We come now to perhaps the most interesting portion of Professor Agassiz's lectures, and those which embody his own original and personal work. They are given in as nearly the exact wording and phraseology as it was possible to obtain them, and commenced somewhat as follows:

"Nothing is more difficult than to present a subject whose evidence is incomplete. Regarding the aqueous or other origin of our island, its geological formation does not present sufficient evidence for us to form an opinion as to that origin that is capable of being sustained. There are, at the present day, many false views of great scientific questions held for want of sufficient evidence to assert the truth. One fact is but a small part of the whole evidence. A great deal of our knowledge, even at the present day, is traced back to Aristotle. The sources of true knowledge are very few. Christianity has, in a measure, prevented the advance of science.—It has made us believe, and many are satisfied with that. Science, generally, hates beliefs.

"In 1836 I first felt an interest in these things. I began to investigate everything. I was at the foot of the Alps, when I found that the shepherds had a theory that the masses of rock, everywhere to be seen about them, had brought down to their present position by what were then known as glaciers. An eminent civil-engineer, who was then present, held the same

(*To be continued.*)

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Our Premium List Supplement was issued for the purpose of increasing the circulation of our publications, but if you are already a subscriber to either or both of them we will cheerfully fill your order for any article offered therein at prices quoted—should any of these prices seem high you can rest assured that there is either QUALITY or QUANTITY, perhaps both, back of them to fully satisfy the most avaricious collector. Try, and be convinced—remember "Lattin" always "GUARANTEES SATISFACTION."

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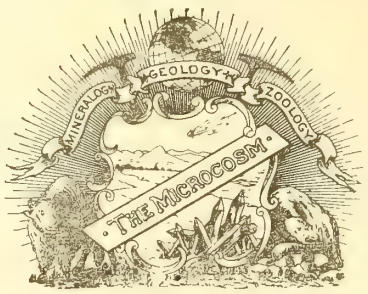

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NATURAL SCIENCE NEWS

VOL. I. No. 39. ALBION, N. Y., OCTOBER 26, 1895. Weekly, $1.00 a Year

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Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
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Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
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Natural Science News.

VOL. I ALBION, N. Y., OCTOBER 26, 1895. No. 39

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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U. S. Government Building, Cotton States Exposition.

The Atlanta Exposition.

In my last letter we were in the Government Building, and had come as far as the Division of Ornithology and Mammalogy. That which will interest us especially here is not the exhibit showing their distribution and range, but that which gives us an idea of the value or otherwise, of certain individual species to agriculture. We see some of these birds feeding on the most destructive of insects, and perhaps these are the very ones some of our friends have been making war upon. Near by is an exhibit of the various insects upon which birds commonly feed. The English Sparrow evidently has no friends here, for he is shown in a peach tree, actively engaged in destroying the buds and blossoms.

Cotton-planters will see, in the Division of Entomology, which is close at hand, that the boll worm and the cotton worm are not the only insects that work harm to their staple. A number of others of secondary importance are shown as well as some that are of benefit to the crop. Insecticides and the methods of applying them are also illustrated.

Much attention has been properly devoted to making a comprehensive display of fibres, as their cultivation, or rather the development and extension of their cultivation, has been a matter to which the government has given serious consideration for some time past. The different types of cotton shown will help to dispel the idea, held by some who are not familiar with the plant, that all cotton is the same. Improved and foreign varieties are brought into sharp contrast with those commonly cultivated, and no doubt many a southearn farmer who studies this exhibit will return to his plantation with the fixed purpose of growing a better crop of a better sort the coming year.

Flax, hemp, sisal, ramie and other fibres, all grown in this country, and shown here to illustrate the possibilities of increased fibre production, are in contrast with a number that were formerly merely waste products, but that are now utilized in many manufactures. Among these latter we see the Spanish moss, so familiar in the South, which is employed for upholstery purposes; pine needles, from the long-leaved pine, made into coarse matting and bagging; cocoanut and palm fibres, used for matting, coarse brushes, etc., and the common saw palmetto, that covers thousands of acres in the Florida peninsula and elsewhere, which is shown to be especially useful for plastering fibre.

At Chicago, the forestry exhibit was one of the marvels, and one of the dfsplays that was regarded as of the greatest economic and practical importance. Here the forestry exhibit is on a smaller scale, but of even greater value, as it illustrates so forcibly the forestry resources of a given section. Three hundred indigenous species are shown by sections of the natural wood and bark and by finished wood. Among the curious trees which we are shown by these specimens can be grown in some portions of the South are the eucalyptus, the bamboo and the cork tree. The adaptability of the magnolia and other distinctively southern woods for cabinet purposes is also illustrated.

Besides the commoner products of the forests, we see here woods that are used for dyeing, tanning and coloring; medicinal roots, mosses, rice paper, gums, resins and vegetable wax; wood pulp, rattan, cane work, etc.

In the forestry building is also the display of the mining resources of the South—the display to which it is hoped the attention of northern visitors and capitalists will be especially drawn. Much of the true success of the exposition rests upon the real interest which is taken in this, as it is hoped that it will be the lever to draw capital toward the South, for the development of its mines and the industries which are related to them.

Phosphates, considered both from the standpoint of the agriculturist and the capitalist, are one of the leading items of this exhibit. Florida and South Carolina are the states which are especially rich in this deposit, and both make a good exhibit of the various phosphates and the methods of mining and preparing them for market and for use. Coal also is of prime importance, and it is here from many States, together with iron, copper and lead ores, marble, sandstones, clays, granite and limes-

stone, and auriferous quartz. Salt is shown in many forms, not in the least curious being the statue of Lot's wife, of heroic size, cut from a solid block of salt from the famous salt mines of southern Louisiana. [The Editor of NATURAL SCIENCE NEWS expects to spend the months November and December at the Exposition and has been offered a position as Lot's wife's right-hand man, which will doubtless be accepted. When you visit Atlanta go to the Minerals and Forestry Building—find Lot's wife and there you will find "Lattin."—ED.]

In the Georgia State Building is an exhibit that somewhat parallels this, except that the display is confined to products of the mines of a single state; and it is supplemented here, too, by displays that seem to be an epitome of all that is shown elsewhere. For almost every department of the whole fair is paralleled in miniature in the building that has been reserved by the Empire State of the South for her own people.

There is, in brief, a vast deal here which may be studied with profit in a large and general way, and which may be investigated more closely by those who would discover what the South has to offer. The result can hardly fail to be favorable to the section that has organized the exhibition, and will without doubt have some influence upon the trend of emigration for the next decade. All who can do so should try and visit Atlanta during the remaining months of the year, and they will at least be able to gain fuller knowledge of the South than they have previously possessed, and more than they would be able to gather by many weeks of travel though it, with its much greater attendant expense. As educators, we cannot overlook the value of these great fairs, and within its limits, the Atlanta Exposition is worthy of the greatest commendation from this point of view.—*J. K, R. in The Cultivator & Country Gentlemen.*

Dr. A. E. Foote Dead.

Dr. Albert E. Foote the distinguished scientist, and one of the best known dealers in minerals and scientific books in America, of Philadelphia died on Oct. 11 in Atlanta, Ga., to which place he had gone in charge of the Pennsylvania mineral exhibit. He had been in poor heath for some time and was in the habit of spending the winter in a warm climate. He had no idea the end was so near and believed that his strength would be renewed if he could get to Florida.

Dr. Foote was born in Hamilton, N. Y. February 6, 1846. After graduating at Courtland Academy, Homer, N. Y., he entered the class of 1867 in the University of the State of Michigan, where he took the degree of doctor of medicine, being especially distinguished for his earnest work and scientific attainments. After some time spent as an instructor at Ann Arbor, he was appointed assistant professor of chemistry and mineralogy in the Iowa State College, which he held for five years, being very successful as a teacher.

In 1875 Dr. Foote removed to Philadelphia, and began the building up of a world wide business in minerals and scientific books. He was a life member of the Academy of Natural Sciences, of the New York Museum of Natural History and the American Association for the Advancement of Science. In 1872 he married Miss Augusta Matthews of Iowa, who with two sons and a daughter, survives him. Dr. Foote's extended travels both in this country and Europe made him well known in scientific circles.

Dr. Foote was one of the most liberal patrons of the advertising columns of NATURAL SCIENCE NEWS, and its readers will be pleased to learn that the business with which he was identified for the past 20 years, will be continued with Mr. Warren M. Foote, a son of the deceased, as manager—a position which he has practically held for a number of years.

The Study of Beetles.

The study of insects is economically one of the most important branches of Zoology, for insects play a most important part in the raising of almost all farm crops. But besides this money value, there is another a cultural value of the study.

Entomology is one of the best of studies to cultivate the powers of discrimination, and the collecting of insects demands close observation and the exercise of ingenuity. It is easily carried on in connection of other branches of natural science, or with manual or professional labor. Any one who has any call to be out of doors in the country or small towns may be in some degree an entomologist.

In comparison with the branches of higher zoology, mammalogy, ornithology, herpetology and ichthyology; entomology affords an immensely larger variety of instinct and structure. This variety gives greater room for new discovery. The *Arthropoda* preserve their distinctive character better than the other invertebrates; and so afford good study material without the manipulations required by plants, worms, mollusks, and minute animals. Among the *Arthropoda,* the *Insecta* are more accessible than the *Crustacea*; the *Hexapoda* more readily preservable than *Arachnida* and *Myriapoda,* and more numerous than all of the other classes and sub-classes put together.

There are certain difficulties in all studies, and perhaps the greatest, in the study of insects, is the scattering nature of literature and the resulting difficulty and cost in securing all the works on even one family of insects. This may be remedied in a measure by subscribing for the few papers published on this subject, and thus getting in touch with the working body of entomologists. There are but two such papers published in this continent. They are the *Canadian Entomologist,* published at London, Ontario, and the *Entomological News,* of Philadelphia.

In such an extensive study, the student must limit his studies. An entomologist will do well to study some one order of insects. Of the seven generally recognized orders of insects, the *Coleoptera* present the greatest advantage in variety of form and habits, and the least difficulty of collecting and preserving for cabinet specimens.

The killing of insects has always been a point of controversy among entomologists. I find alcohol the best means for killing beetles as it does not affect their color, it leaves them pliant long after those killed by other methods are stiff and brittle, and it is sure of results. Other very good death-dealing agents are potassium cyanide, chloroform, and carbon disulphide.

Although many appliances are recommended for collecting insects, four will answer nearly every purpose. They are the alcohol bottle, the sweep-net, the dredge, and a stout bladed pocket knife or better a butcher knife. Any wide mouthed bottle will do for a collecting bottle. The sweep-net may be conveniently made by fastening a stiff wire frame to a short hard-wood handle and securing to it a flour sack. An easy way to make a dredge is to fasten a patent flour

sieve to a strong stiff handle about three feet long, after having removed the revolving part of the sieve.

After you have collected your beetles, exercise all your skill to make a neat collection as well as one that is scientific, for "a thing of beauty is joy forever" and some can gainsay the fact that a well-mounted collection of insects is "thing of beauty." There are two lengths of insect pins commonly used, one an iuch and a half long and the the other one and a third long. Though for general purposes the longer pin is the best, the shorter pins are better for beetles as they are stiffer and so pierce the hard integuments more readily. An incidental benefit is that shallower drawers or boxes may be used.

All insects collected and pinned should be labeled. The best plan for this is to have very small labels printed. There should be three kinds of labels, with the month, collector's name, and county and state locality.

These should be pinned on the same pins that the insects are pinned. Thus in the case a specimen of *Tetracha virginica* there would be a half inch from the head of the pin, the beetle, then about the middle, July, just below this, John Jones, and last of all Douglas Co., Kan. At the left of the first of the four specimens, in the bottom of the case there should be 13. *Tetracha virginica, Linn.* (The number in Henshaw's Check-list, the scientific name and its authority.)

Above all things remember a collection in any scientific study is only a means to an end, that end being learning, and that the great end in all is to understand some portion of the great system laid down in the beginning by the great authors.

John Colburn Bridwell,
Baldwin, Kans.

Artistic Taxidermy.

We clip the following from a recent issue of the *Washtenaw Times* (Ann Arbor, Mich.):

There has just been completed in the University museum a piece of work which in the line of artistic taxidermy is probably unequalled in the United States. It is a case of North American mammals and is the work of Adolph B. Covert, the taxidermist.

On entering the mammalian room the first object that arrests the attention is a group of three Michigan deer lying partially concealed in a mass of willows and tall grass. Immediately back of these is a fine specimen of American buffalo, and accompanying him is the prairie dog, characteristic of the western plains. Then is found a group of muskrats, a mother rat with little ones scarcely larger than your finger. Adjoining the rats are the mink and otter; the latter is a remarkably fine specimen and is indeed a true work of art. The Jack rabbits and northern hares, also the common grey rabbits are next in order, and then come a group of gophers and chipmunks; of the latter a fine albino specimen is shown. Passing on one comes to the badgers, and near their den is a group of woodchucks. In this collection the old fellow coming out of the hole looks as though he were alive. Near these and at the foot of the hill lies a fine old buck deer. At the rear of this deer arises a large oak tree upon which are found squirrels, opossums, porcupines, bats, etc. At the front of the case is another group of opossums.

A colony of beavers next arrests the attention. There is also a fine group of foxes, both red and gray, and a very large gray wolf from north Michigan. Close by is a small group of weasels. Then we come to the lynx and wild cats. One of the lynx is standing over his prey with ears laid back, eyes half-closed, and open mouth: words cannot express the look upon his face, it must be seen to be appreciated. The other lynx is lying at the mouth of the hole, his big heavy feet stretched out in front of him and a good natured, "don't care" look upon his face. On the edge of the rocks and looking down at the lynx is a gray wild cat from Colorado; here again facial expression plays its part, for he has a look of cunning inquiry as if to say, "Who are you anyway?" Behind this cat on a fallen log are two red cats from northern Michigan; the older and larger of the two has a squirrel in her mouth. Near these and behind the lot of rocks is the bear den, containing six fine specimens in all stages of growth; an old female and her two cubs being in the foreground, while in the rear and coming out of the den proper is a fine male sdecimen. Here we also find the "coons," some asleep, others on the limbs of the trees, while one old fellow sits on a decayed stump; of these there is a fine albino specimen, also a black one.

Upon the rocks and near the center of the case, with open mouth, front foot raised and tail lashing his sides, stands a mountain lion, the masterpiece of the entire case, and well worth a day's journey afoot to see. Immediately at the heels of the lion stands a snarling coyote or prairie wolf. Above these is a group of wolverines, and close to them stands a huge grizzly bear with claws as long as your finger. Then come more gray wolves and wild cats and a small group of pine martens or sables. And as a finish, on a high, over-hanging rock is a bighorn or mountain sheep.

A profitable half day can be spent in looking at this case, and one is almost lost in wonder as to how this work has been done. It was designed and executed by Mr. Covert, who is making a specialty of museum grouping. The only assistance he has had has been from Mr. Wood, the janitor of the building. Mr. Covert is now at work upon a large case of birds which gives promise of being a thing of beauty, but of this more later on.

Albino Striped Gopher.

Spermophilus tridecemlineatus.

On May 7, 1895 a friend of mine brought me a nearly pure white Striped Gopher, which he had snared in his cornfield, in Troy township, this county. There is just a few dark hairs on its head and one or two places on the back, otherwise it is pure white. On examination it proved to be a female. Careful measurements show it to be a little less in size than the average Gopher.

I have always lived in a gopher county. In Wisconsin when a boy I often traped and snared twenty in a single day. Here in Minnesota they are still more in numbers than in Wisconsin. I have lived in Minnesota eighteen years, and perhaps I have seen several thousand of these little animals. This is the first Albino that has ever come under my notice. I think they are very rare. There was a report of one being taken near where this one was killed, but it spoiled before it reached me, and I did not even get a chance to see it. The date of this was in June, '93. I shall watch this locality, and perhaps you may hear from me again.

A. D. Brown,
Pipestone, Minn.

PENIKESE—A Reminiscence.

By One of its Pupils.

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view. Hitherto, the theories respecting the geological formation of the earth, as held by Wernes, were that all this material had been brought together by water and flood; the Scottish school of scientists maintained that it had all been accomplished by volcanic action. A violent feud ensued. Leopold Von Buch asserted that both were right. He gave to geology its present shape. I was then a student. Being at the foot of the Jura, I saw rocks in places where it was impossible for water to carry them. The thought came to me that glaciers transported rocks in Switzerland, and why not here also? I thought: why might not glaciers occur in other countries than Switzerland? I went to other countries and studied the evidence. I found that the rocks which glaciers moved were polished, or rough and scratched. Water rocks were hollowed in soft spots, thus making prominent the hard places. Ice produces a smooth surface. Pebbles worn by water are smooth like a hammered surface—but dull, not shiny; ice polishes the surfaces and scratches them. If the ice goes in one direction all the creases will run in one direction. Loose pebbles scratched by ice and by water are also different. Erratic boulders are always found in connection with loose materials which are scratched and polished. Loose materials are not stratfied. I found out these facts in my study in Germany, France, and in other countries. I went to England, and there found evidence of this glacial action. I was with a friend—a Mr. Buckland —and we were at first alone in our theory.

"The conclusion we reached was, that at one time the globe was much colder than it is at present. In science one should never suggest anything for which there is not some foundation. The glacial period must have been posterior to the geological period when mastodons and elephants inhabited the whole globe and the climate was more tropical than it is now. We estimated that ice was once 10,000 to 12,000 feet deep all over the globe. It is chiefly in temperature that changes occur. If ever our island (Penikese) was below the sea, why not find the same rolled pebbles and low-tide marine animals? No sea has been beating here, for we find no sand or loam has been washed away. All the loose materials remain *in place*. The greater part of the local peculiarities, such as depressions and inequalities, will have been produced by rain. Glacial action *will* explain the peculiarities we see on land here. There is nothing so hard to protect as a man's intellect. We can get no patents on our investigations."

The same subject follows in his next, or fifth lecture:

"A geological period or age ago, the surface of the earth was covered with boulders; this was before there were either plants or animals to be found upon it. Now to understand and to translate the transportation of glacial rocks we must understand the formation of glaciers. The idea of glacial motion originated with the peasants of Switzerland. A civil engineer, Verner by name, and a peasant, Chapantea, however, got much of the credit for field observation which I had myself done. In 1837 no geologist admitted that rocks were moved by glaciers; most of them admit it now, though in a somewhat modified condition. The early scientists who were interested in and studied into this subject, were Schenchter, who also first described several fossil fishes; Horace Benedict de Saussure, who published his travels in the Alps, and who first described glaciers; Chapantea, who studied them considerably and published articles upon them; and myself, Professor Forbes, and Mr. Tyndall, who, lately, described their physical constitution, action, etc. Of these Mr. Tyndall's work is the best. We now come to the question, What is a glacier?

"Glaciers are composed of different materials according to the positions selected for investigation. On mountain top they are mere snow fields; deeper, they are composed of ice crystals, the ice becoming more and more compact as you go downwards; until the bottom is clear, solid ice. Snow when resolved into fine granules is called *neve*: where this changes to ice is called 'the limit of perpetual snow.' Physical geographies are incorrect in their statements of the snow-level on the Straits of Magellan and many other places. Similar conditions are found at the same line of perpetual snow; they are also similar in the same number of degrees distant in different localities. Glacial ice differs from common ice,—the first is composed of ice crystals melted together and can be reduced to powder, the latter is formed in layers. Glaciers possess a motion in themselves which is both an upward and a downward motion; it is greatest in the middle, and least upon the edges. Moving ice, therefore, exerts a great power. As the glacier moves, it collects a large quantity of loose materials which it carries along with it. Part of this material over-crowds itself and forms a low line of rocks on either side of the glacier: these lines are called lateral moraines. When two glaciers or two arms of the same glacier unite, they continue as one, while their lateral moraines unite and form a medial moraine. The bottoms of glaciers, then, being covered with rocks, act like an immense rasp. In passing over walls of rocks, or open faces of exposed ledges, both the upper faces of the under rocks, and the under faces of the upper rocks, which are in the glacier, are scratched and scarred alike. Yet the rocks which are *in the glacier* will still be angular above where only the ice covers them. Now the continual motion of the ice pushes forward the larger rocks, and at the same time all the loose material is gronnd still finer; and each pebble rounded in a manner which is never produced by water. Thus the moraines are ground more and more as they advance, so that, whatever their shape may at first be they come out, at the end of the glacier, rounded material, and when the glacier begins to melt and to recede they are deposited as single or successive *terminal* moraines. These are crescent-shaped ridges or walls of rock and loose material. If small glaciers will accomplish so much, what might not large ones do?"

In his sixth and seventh lectures he still continues:

"When a glacier meets with an obstacle it breaks and forms crevices. You will find no crevices in *neve*. The more compact the ice the deeper and broader these are. In a hot day the sides of the glaciers melt and form small brooks. These are sometimes too wide to cross. They carry with them an immense amount of rubbish, which fills up many of the cavities and gaps, and makes pot-holes and new excavations. Sometimes one of these brooks will traverse the whole length of a glacier.

"The geological phenomena connected with glacial action is extraordinary. There are boulders upon the Jura which, in mineral character, have been

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

Our Premium List Supplement was issued for the purpose of increasing the circulation of our publications, but if you are already a subscriber to either or both of them we will cheerfully fill your order for any article offered therein at prices quoted—should any of these prices seem high you can rest assured that there is either QUALITY or QUANTITY, perhaps both, back of them to fully satisfy the most avaricious collector. Try, and be convinced—remember "Lattin" always "GUARANTEES SATISFACTION."

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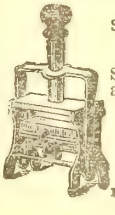

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We are now putting up Florida Sea Shells and Curios in beautifully turned and polished **Hard Wood Boxes;** thereby saving to our customers freight or postage on a worthless case.

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At present we are making three sizes: A 50 cent size containing 25 fine shells and curios, with three first-class Florida photographs. A $1.00 size containing 50 fine shells and curios, with six first-class Florida photographs. A $2 00 size containing 120 fine shells and curios, with 12 first-class Florida photographs.

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Many of our customers write us that they have been well pleased with the orders we have filled for them and that they always get two or three times as much for the money as elsewhere. We intend to sustain this reputation and shall always do as well or better than we advertise.

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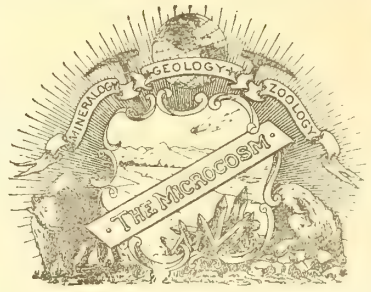

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October 22, 1895.

When answering advertisements always mention Natural Science News.

NATURAL SCIENCE NEWS

VOL. I. No. 40. ALBION, N. Y., NOVEMBER 2, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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WANTED to Exchange.—First-class Bird Eggs and Bird Skins and a few mounted birds for a Camera in good ordor. Send your price and receive my list. FRED K. WARREN, Holley, N. Y.

I HAVE a few sets and many single eggs to exchange for eggs not in my collection. J. S. APPLETON, Simi, Ventura Co., Calif.

TO EXCHANGE.—A Bracket and fret saw, with extra blades, patterns, impression paper, and Manual of Fret Sawing and Wood Carving with illustrations, for a second-hand pair of Lattin's Climbers, unstrapped. The saw is good as new, cost $1.25. Climbers must be in good condition. EDGAR C. HUTCHINS, Clinton, Hinds Co., Miss.

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No exchange of less than $2 will be accepted unless 10 cents extra is enclosed for postage and packing.

I also want many foreign species. Write what you have and wish in exchange.

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Small egg drill	$ 8
Medium egg drill	15
Large egg drill	20
White metal blowpipe	25
Nickle-plated embryo hook	25
6 checking lists	15

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Lark Bunting	30
Am. Herring Gull	25

FOREIGN.

Pheasant	40
Partridge	30
Barbary Patridge	35
Capecaille	75
Blue throated Warbler	75
Dartford Warbler	75

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The "Leader" shell collection, 61 species, labelled with scientific name and locality	$ 00
Giant Calif. sea urchin	1 00
Giant Bahamas sea beaver	3 00
Very large carnelian agate	1 50
Polished carnelian agate, suitable for ring setting	25
Polished tiger-eye, *Crocidolite*, do	25
Polished chalcedony, do	25
Polished bloodstone, do	25
Polished onyx, do	25
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[illegible], from Georgia. Very curious, can be bent with ease; fine specimen	1 00
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Fine piece azurite and malachite	1 25
Fine piece lodestone *magnetic*	1 00
Fine piece flourite	40
Good piece celestite	25
Quartz crystal, fine	.50 to 1 00
Chiastolite	40
Collection of 15 varieties of named fossils.	2 50
Gun flint, Revolutionary relic	20
Marine algæa, fine spray mounted on card	10
Fine specimen ancient Costa Rican pottery many hundred years old	4 00
Fine spearhead Kentucky	50
Fine spearhead, Indiana	50
Fine arrow point, Indiana	25
Fine arrow point, Kentucky	25
Fine arrow point, special forms	1 00
Bright colored So. American Bird Skin	50
Do., five all different	2 00

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Stearns' Natural History of Labrador	1 00
Short's Birds of Western New York	20
Directions for Collecting Minerals	15

All eggs must be strictly *first class* in *every* particular. If they are not I will take out eggs to *five times* the actual cost of return postage for same and trouble, and return the balance.

This offer expires Dec. 1st, and will not be repeated. Pack your eggs carefully and send to

ERNEST H. SHORT, Albion, N. Y.

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NEW YORK CENTRAL

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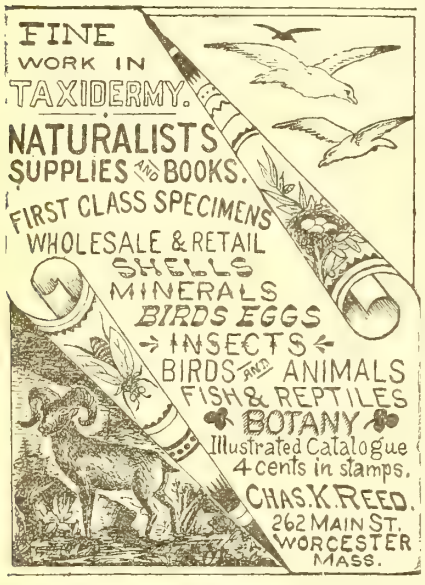
Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00



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Hermit Thrush	$ 20
Tufted Tit	25
Carolina Chickadee	25
Red-breasted Nuthatch	25
Carolina Wren	30
American Redstart	20
Hooded Warbler	45
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Egret Plumes.

No birds are more beautifully decorated than Egrets. Their name is a corruption of the French word *aigrette*, and is particularly applied to those species of Herons which are ornamented with tufts of loose-webbed plumes growing from the head, the sides of the neck, or the back. The Egrets *par excellence* are a group of snowy-white Herons, of which our own little White Heron or Snowy Egret of the South is a typical representative. Indeed, it is this species that forms the chief source of the most delicate and most coveted of the plumes so extensively used for decorative purposes in millinery, nor is it surprising that such graceful objects should be sought as an article of ornament. But those who wear them are rarely aware of the cruelty their use occasions or the wholesale destruction of innocent bird-life which is required to maintain the supply. The beautiful plumes are the nuptial ornaments of the birds and are worn only during the breeding season, when they are common to both sexes. Hence, in order to secure them, the birds must be killed during the nesting period; and if we should tell the cruelty and havoc to the Egret colonies which attend the slaughter of these beautiful creatures, any woman of humane feeling and refinement must look with horror upon the wearing of ornaments obtained through such a sacrifice of life.

Formerly the Egret species were abundant from the Middle States southward, particularly in the South Atlantic and Gulf States, in Central and South America, and as far South as the Argentine Republic.

Associated with the little white Egret, and having about the same range, is a larger species, the great white Egret, also pure white and beautifully plumed. In this species the occipital plumes are lacking, but the plumes from the back are long and abundant and form a magnificent drooping train.

Fifteen years ago these beautiful birds were in almost undisturbed possession of the swamps and swampy islands of southern Florida, where, in large rookeries of hundreds and even thousands of pairs, they reared their young in safety. Shortly after this date their haunts were invaded by the murderous plume-hunter, and as colony after colony became depopulated in the more accessible parts of their haunts, they were pursued into the remotest bayous of the interior. Thus an ornithologist of note, writing in 1890 of a recent trip to the keys and everglades of South Florida, says: "The 'plume hunter' is in greater numbers and more active than ever in South Florida, and there are absolutely *no Heron rookeries* on the salt water bayous or on the outlying keys of the Gulf coast of Florida from *Anclote Keys to Cape Sable.*"* During weeks spent in these regions scarcely an Egret was seen, where ten years before their snowy-white plumage and graceful forms were a conspicuous feature of the landscape.

For several years Fort Myers was the seat of the traffic. Local traders were ready to pay high cash prices, not only for Egret plumes, but for all bird skins that could be utilized for millinery purposes. In winter the region was visited by buyers from the North, "provided to equip hunters with breech-loaders, ammunition, and the most approved and latest devices for carrying on the warfare." It is notorious that one man from New York employed regularly for years from forty to sixty gunners in this murderous work. It is little wonder, then, that the beautiful Egrets and hosts of other less attractive birds were almost exterminated in South Florida, or that the hunters and milliners' agents were compelled to seek new fields for the prosecution of the nefarious business in Louisiana, Texas, eastern Mexico, and the northern portions of South America.

But the slaughter of these beautiful creatures and the rapid extermination of species after species of the most attractive and harmless forms of bird life are by no means the worst feature of this barbarious business. As we have said, the much-coveted plumes are worn by the birds only during the nesting season, when they are assembled in colonies to rear their young; but we must add that at this season these usually wary birds are approached with comparative ease. Affection for their young renders them less watchful for their own safety, and when their nesting haunts are invaded they fall an easy prey to the hunter, who shoots them indiscriminately as long as a bird remains. Says the writer already quoted: "They are hunted, just during the period of the full perfection of the plumes, with such unremitting perseverance by the cruel plume-hunters that scarcely a rookery, no matter how small, escapes." At the larger rookeries it was not uncommon for a single hunter to kill a hundred Egrets in a day, for days in succession. The hunter cunningly secretes himself and uses a small rifle, which makes little noise and does not greatly alarm the birds; and the murderous work is continued till the few birds which remain are no longer worth the time it would take to secure them. The birds that are left alive soon desert the region; and where there was once a vast rookery so covered with Egrets "as to look from a distance," as one hunter expressed it, "as if a big white sheet had been thrown over the mangroves" not a living bird remains.

The dead birds are gathered up by the hunter, the portions of the skins containing the plumes are stripped off, and the bodies are left in heaps to putrefy or become the food of Buzzards and other birds and beasts of prey. The trees are still full of nests, some with unhatched eggs, but many contained young, doomed to a *lingering death from starvation.* An eye-witness of one of these scenes says of an island that had thus been desolated only a few days be-

* W. E. D. Scott, in *The Auk*, 1890, vol. vii., p. 221.

fore his visit: "The trees were full of nests, some of which still contained eggs, and hundreds of broken eggs strewed the ground everywhere. I found a huge pile of dead, half-decayed birds lying on the ground, which apparently had been killed only a day or two before. All of them had the plumes taken with a patch of the skin from the back, and some had the wings cut off; otherwise they were uninjured. I counted over two hundred birds treated in this way. I do not know of a more horrible and brutal exhibition of wanton destruction than that which I witnessed here."* This is only one tragedy out of hundreds enacted in the wilds of Florida and other portions of the Gulf coast during the last decade, till the beautiful plume-bearing Egrets have been reduced to a few scattered pairs, driven for the most part to well-nigh inaccessible resorts.

For what purpose and at whose behest is all this cruel slaughter of the innocents? Fashion demands it in behalf of "the gentler sex," that they may bedeck themselves with the barbarious adornments of the savage!

It is for "tender-hearted woman" that this sacrifice is made.—*J. A. Allen in Our Animal Friends.*

* W. E. D. Scott, in *The Auk*, vol. iv., p. 214.

Dr. Merriam's "Meph."

Dr. C. Hart Merriam gives the following interesting account of a pet *Mephites mephitica* in his valuable work, "The Mammals of the Adirondack Region:"

Two summers ago I was the happy master of the cleverest young Skunk that I have thus far chanced to meet. For a name he received the title of his genus, and we called him "Meph." for short. By way of precaution I removed his scent sacs, and he made a rapid and complete recovery, after a few days of temporary indisposition. While driving about the country, in the performance of professional duties, he usually slept in my pocket. After supper I commonly took a walk, and he always followed, close at my heels. If I chanced to walk too fast for him, he would scold and stamp with his fore-feet, and if I persisted in keeping too far ahead, would turn about, disgusted, and make off in an opposite direction; but if I stopped and called him he would hurry along at a sort of ambling pace, and soon overtake me.

He was particularly fond of ladies, and I think it was the dress that attracted him; but be this as it may he would invariably leave me to follow any lady that chanced to come near. We used to walk through the woods to a large meadow which abounded in grasshoppers. Here "Meph." would fairly revel in his favorite food, and it was rich sport to watch his manœuvres. When a grasshopper jumped he jumped, and I have seen him with as many as three in his mouth, and two under his fore-paws, at one time! He would eat so many that his over-distended little belly actually dragged upon the ground, and when so full that he could hold no more, would still catch and slay them. When so small that he could scarcely toddle about he never hesitated to tackle the large and powerful beetle known as the "horned bug," and got many smart nips for his audacity. But he was a courageous little fellow and it was not long before he learned to handle them with impunity, and it was very amusing to see him kill one. Ere many weeks he ventured to attack a mouse, and the verocity displayed in its destruction was truly astonishing. He devoured the entire body of his victim, and growled and stamped his feet if anyone came near before the repast was over.

His nest was in a box near the foot of the stairs, and before he grew strong enough to climb out by himself he would, whenever he heard me coming, stand on his hind legs with his paws resting on the edge of the box, and beg to be carried up-stairs. If I passed by without appearing to notice him he invariable became much enraged and chippered and scolded away at a great rate, stamping, meanwhile, most vehemently. He always liked to be carried up to my office, and as soon as strong enough, would climb up of his own accord. He was very sprightly and frolicsome, and used to hop about the floor and run from room to room in search of something to play with, and frequently amused himself by attempting to demolish my slippers. I have often given him a bit of old sponge, with a string attached, in order to keep him out of mischief. During the evening he occasionally assumed a cunning mood, and would steal softly up to my chair, and standing erect would claw at my pants once or twice, and then scamper off as fast as his little legs could carry him, evidently anxious to have me give chase. If I refused to follow, he was soon back, ready to try a new scheme to attract my attention.

Albino Eggs.

In my limited experience with birds, I have found several sets of albino eggs belonging to the Bluebird and from notes of collectors I find that they are rather a common occurrence. Several questions have been raised in my mind concerning them. I relate my own experience in this line, hoping that it will prompt others to give the results of their observations and conclusions on this point.

I have often wondered whether the same birds might lay sets of naturally colored eggs and at other times sets of albinos. From a recent article in the NATURAL SCIENCE NEWS and from other notes I inferred that the results of other collectors did not justify such a belief. Besides, the birds laying albino eggs are of a different shade of color from the ordinary types.

The results of my own experience do not agree with these observers. My first set of albino eggs was found in an old stump, opening from the top downwards, but the nest being disturbed the birds left and I failed to locate their nest again that season. The next season a pair of Bluebirds took up their abode in a box near the house. The first set of eggs were albinos. The nest was not disturbed and the eggs were all hatched by the mother bird. In observing the parent birds and the younger I could detect no departure from the normal color.

After the first brood had left the nest and gone to seek their fortunes in the bird world, the nest soon contained a new set of eggs of the ordinary color, which I have reason to believe were deposited by the same pair that had laid the albinos.

This is the only evidence on which I may base my claim. Probably it is insufficient. The second pair might have been other than the first. But of one thing I am sure. An albino set was succeeded by a set of natural coler. I should like to hear from others on this point.

GUY J. KOONS,
Isabel, Ills.

An Odd Spermophile.

I have just received a—to me—curiosity, a color freak in squirrels. It is a young Oregon Ground Squirrel, in the local vernacular, a "digger."

It is a Spermophile, the body including the head, is 8 inches long; tail, 6¼ inches; hairs extend 1¾ inches further; tail flattened, somewhat bushy; thumb rudamentary, no claw; soles naked; whisers well developed, long as the head, dark at the roots, becomming light to silvery white at the tips; ears conspicuous, ⅝ inch long, inside fuzzy, outside hair long as hair on neck, similar and extending beyond tips of ears but not tufted; back, head, ears, sides and tail a dull, but very distinct yellow color, not dark, and very slightly hoary; a lighter plumbeous, indistinct not well defined, stripe along the sides; whole under parts, including throat and under jaw, a bright buff yellow; the line of demarkation with upper parts well defined, similar to "Oregon Chickaree," *Sciurus Douglassii*; tip of nose bare, flesh color; hair on tip above passing into nearly white, silvery; eyes, yellowish iris, black pupil. (The eye of the *Spermophilus Douglassii*—"Oregon Digger"—is black.) It is about half to two thirds grown, and exactly resembles a young *Spermophilus Donglassii* except color.

I regard it a sport in color; possibly a cross with Oregon Chickaree, if such a thing is possible, which I doubt. It was killed some five miles east of here, but I know nothing of its history other than that.

I have been in Oregon 42 years. The *Spermophilus Douglassii* is very plentiful here. I have seen a white "silver-grey" squirrel, a white coon, a very nearly white mink, a white robin, (*T. migratorius*) and a natural colored robin spotted all over with round white spots the size of peas. I have a stuffed white *Spermophilus Clarkii* from eastern Washington, and I had a black sparrow hawk. But yellow is new to me.

But Oregon is a queer country, and there need be no surprise at anything it may produce. There are plenty of "green" people here, and many persons who *look* "blue" (and *feel* so) because of the "times," and it is alleged that old Oregonians are web-footed, still a yellow squirrel is a novelty.

F. S. Matteson,
Turner, Ore.

Blue-prints.

It may not be generally known that blue-printing can be done successfully with ferns and the prints used in many ways. In making blue-prints of ferns the two essentials are the pressed ferns and blue-print paper. This paper can be bought from any dealer in photographic or artists' materials, and can often be procured of architects. When it is exposed to direct sunlight it turns dark, and an insoluble blue compound (Prussian Blue is formed on the paper. If any part is shielded from the sunlight this action does not take place there, and when the paper is thoroughly washed in a stream of water we have a blue ground with a white object on it, where it was shielded from the light. So that if a fern or leaf be laid on the paper before exposing it we shall have a very accurate impression of it. In one of my prints of Adiantum even the veins show. After washing the print until the covered part becomes white the color is permanent and the paper is then to be dried. In practice I place a couple of folded newspapers on a large book. On this is the sheet of prepared paper, then the fern and finally a pane of glass. The glass and newspapers are to hold the fern as closely as possible against the blue paper to avoid blurred edges in the prints. Hold this in bright sunlight three or four minutes (here is where experience comes in) and then wash the paper thoroughly to fix the print. It is often convenient to paste a strip of paper on the glass plate so that it will cover the lower edge of the blue paper, thus leaving a convenient space for writing a label. If we wet stiff paper with a saturated solution of bichromate of potash in water and dry it, we can in a similar manner have white impressions on a more or less brownish background, but they are not as clear as blue-prints.—*C. E. Waters, Baltimore, Md., in Linnœan Fern Bulletin.*

A Snow Flower.

The spacc of Meehans' Monthly is so limited, that room can scarcly be afforded for newspaper "fakes," but the enclosed from St. Louis *Democrat* is to good to be lost. The "Professor" should next try his pen in the manufacture of a "Fire plant." The seeds could doubtless be transported by means of an ingenious contrivance for keeping kept red hot by a spirit lamp:

"One of the greatest curiosities I ever met with in my travels," said Prof. Philip L. Newman, of Cincinnati, "is the sunflower that blooms in the northern portion of Siberia, where the earth is continually covered with a coating of snow and frost. This wonderful plant shoots forth from the frozen soil on the first day of the year and reaches the height of about three feet; it blooms on the third day, remains open twenty-four hours, and then returns to its original elements. It shines for a single day, then the stem, leaves and *flower are converted into snow.* The leaves are three in number. The flower is star-shaped, its petals about as long as the leaves and about half an inch wide. On the third day the extremities of the leaves show little glistening specks, like diamonds, about the size of the head of a pin. These are the seeds of this queer flower. I was told that on one occasion, some of these seeds were gathered and hastily transported to St. Petersburg. They were there placed in a bed of snow, where they were kept until the first of the following year, when the sunflower burst forth and was greatly admired and wondered at by all who saw it."—*Meehans' Monthly for October.*

Indian Rubber Plants.

A large number of plants in gardens known as "rubber plants" are not among those which furnish the chief amount of rubber used in the arts, and the Indian Rubber,—so called,—and so common in gardens, furnishes but a very small part, if any, for the rubber commerce. There are quite a large number of plants which furnish this gum. In Africa they have discovered that plants of the genus *Landolphia* furnish immense quantities of rubber equal to any in the market, and that it can be collected at a comparatively low cost. Africans are, however, not disposed to be industrious, and only six hundred pounds were collected last year, although Europeans have offered strong inducements to the natives to collect. It is believed, however, that in a few years rubber from the *Landolphias* will play no mean part in commerce.—*Meehan's Monthly for September.*

PENIKESE—A Reminiscence.

By One of its Pupils.

Copyright secured 1895.

traced to the Alps; and at the foot of the Alps is a pudding-stone which is found in the Jura. There is no doubt as to where it came from. Professor Guyot has done more than any other man in studying erratic phenomena. He has proved, that what is in reality done between the Alps and the Jura has been done by glaciers and not by water sweeping up the plains. Water would leave transverse ridges of rocks, while those which occur are in longitudinal ridges, and must have been caused by glaciers from the Alps. How, then, while Switzerland was so cold could England and other countries have been so warm. *I* think that the whole globe was covered with ice. I have found traces of glacial action everywhere in mountainous districts that I have searched. In the White Mountains, north of Franconia mountains, is a ridge of thirteen plain morraines. They occur on all sides of the mountains, also. There are signs in New York, Ohio, Maine, New Hampshire, Massachusetts, as far as British America, and still other places. Everywhere is evidence of a great glacial sheet, of immense thickness, passing over mountains five and six thousand feet high, which left boulders of a similar nature upon their tops and each of their sides. I think that the ice in some places must have been at least fifteen thousand feet thick. It moved in a North-South direction. In Siberia, Asia, and in the United States, gigantic animals were found imbedded in the ice, in perfect preservation, and showing the contents of the stomach,—proving that they must have been overpowered suddenly,—perhaps by frost. I think that our large and small rivers are the result of the melting of these glaciers.

"Drift phenomena must be studied locally. There must have occurred local ice which distributed itself in plains different from that which came down from the mountains. The idea that the glacial period was simply an extension of the Arctic ice is nullified by the fact that at the southernmost limit of that ice sheet is a large moraine. The drift wanes in distinctness from north southward. This period, therefore, was not an enlargement of the northern glaciers. In America are intimations of local glaciers, but they are few; for example, in the White Mountains, on the cost of Maine, and especially at Mt. Desert. The characteristic of drift in America is that it extends over a plain evenly, and without indications of lateral moraines. The hills on the borders of Lake Superior are scarred over their whole surface: slope and summit. Indications that this action has been even from north southward is, that the south side of the rocks is not polished, but the boulders are rough and unmarked. In some places there are deviations of much less extent running from 20° to 30°, sometimes almost at right angles with the main line: these are indications of local glaciers—these often run northwest and southeast. Another peculiarity of American glaciers is that most of our boulders are rounded —those of Europe and Scotland are angular; where we have circumscribed glaciers we have rounded boulders. We seldom find median moraines in America. The Arctic glaciers encroach largely upon the sea. Our continent has once extended into the sea in the shape of a drift. The level at which the drift extended over all these islands was the same. I think that these islands were once mainland. Local glaciers have been described in many localities, especially by Professor Dana; but they are the effect of a great northern drift and not from local causes, as might be implied."

Toward the last of the session he returned to the subject and gave us his final lecture upon this wonderful subject. He says:

"Perhaps the most important feature of glacial action is found in the terminal moraine. It contains a mineralogical collection from all the region around, which comes from the upper regions and falls or is detached by the glaciers, and all pushed together toward this terminal point of the ice. To examine these moraines and trace the specimens found to their real or probable bed rock is a most important labor of the geologist. That glacial action was once carried on to an extent much greater than could have been possible had the period begun with an enlargement of the Arctic glacier. Thus we find copper identical with Lake Superior copper in Michigan, Indiana and Iowa, and even as far as 500 miles south of its origin, having distinct marks of glacial agency upon it. The rate at which glaciers moved in America is not certain. In the Alps, where the slope adds to the inclination, the maximum motion per day is one foot; the minimum thirty inches per year. Let us assume that our glacier moved 100 feet a year,—and it will take fifty years for the boulder to go one mile or 25,000 years for it to reach its present position."

[It has often struck me as a curious fact that in estimating geological time Professor Agassiz (as well as others) makes no account of the fact that were the motion or the glacier thirty inches a year the period would be forty times that amount or 1,000,000 years; if, on the other hand, the motion were faster, the time would decrease in proportion. The rate of time necessary to accomplish a given object may not always correspond with the numerical calculations of writers. Experiments in the chemical laboratory are sufficiently numerous to show the different actions of the same substance under different circumstances, to make us pretty careful as to how we lay down a law upon insufficient evidence. Hence, our given geological time *must* be more or less hypothetical under any circumstances.]

"Large animals being found imbedded in the ice are evidence of its coming quickly. It is not likely that a snow storm capable of freezing large animals in Siberia and North America would be limited to one particular region. It would be graded according to latitude. The question is, how much was there in the coldest latitude; how much in the warmest? Let no one fail to urge upon the members of any expedition to the Arctic regions the importance of ascertaining the motion of Arctic icebergs and glaciers. This motion can be ascertained by the amount of icebergs which float away from their extreme southern limit."

It is thus that we learn the first principles of glacial action. How careful our instructor is to distinguish *facts* as truths; and *possibilities*, only, he weaves into theories, which he is very careful to impress upon us *are* possibilities. In a letter made public some years since, he said: "The office of Science is not to record possibilities, but to ascertain what nature does," again—as far as one "deals with mere arguments of possibilities or even probabilities, without a basis of fact," he says, that one "departs from the true scientific method." These words are as true today as they were the day they were uttered; they will be as true a thousand, yes, ten thousand years hence: Living truths that never die.

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

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October 22, 1895.

Natural Science News.

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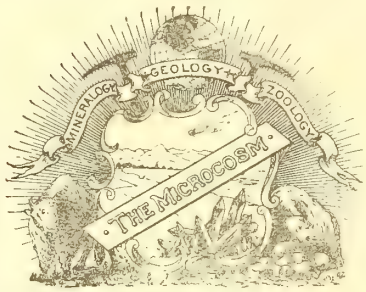

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NATURAL SCIENCE NEWS

VOL. I. No. 41. ALBION, N. Y., NOVEMBER 9, 1895. Weekly, $1.00 a Year

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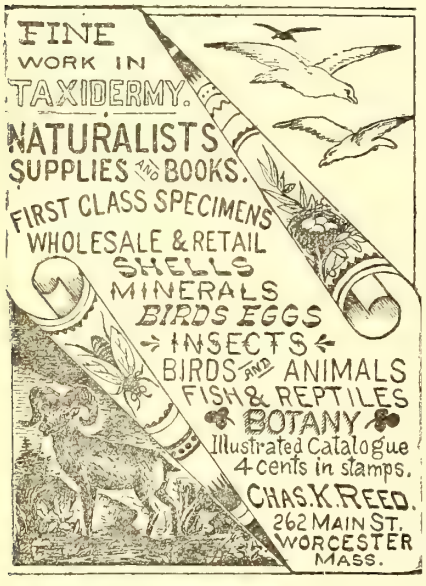
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion..... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00



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31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
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35	Sea beaver	15
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ONE GIVES RELIEF.

Natural Science News.

VOL. I ALBION, N. Y., NOVEMBER 9, 1895. No. 41

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Snakes and Fishes.

One of those quiet workers connected with the Museum of Comparative Zoology, at Cambridge, who for years has been conducting most interesting researches, is Dr. Samuel Garman, whose name very rarely appears in the newspapers, yet whose work is of such quality that it has gained him the highest honors from institutions abroad.

Dr. Garman is a Western man, and has been on the staff of the Museum for thirty years or more. He was with the elder Agassiz in South America and elsewhere, and since that time he has accompanied or led a number of others of the expeditions of this institution. At the time that Stanley made his celebrated march across Africa, Dr. Garman was just about to head a small party for exploration in the Dark Continent, but the excitement among the natives which followed the former expedition made it seem judicious to give the latter up.

Dr. Garman's particular field in the animal kingdom is that of the snakes and other reptiles and fishes. He can tell tales from his own experience which would put to blush the most imaginative of the stories of the authors of today, and is well prepared to hold his own when the conversation takes on a fishy strain, even in the presence of the oldest and most fortunate of anglers.

He is on intimate terms with all the snakes, handles them without fear, keeps them about his laboratory (in cages however) for purposes of study, and has discovered no end of curious things about them, all of which are faithfully stored in great volumes of publications, where the public has hardly a chance to get at them.

A rattlesnake, a native of Missouri, has boarded with him for upward of two years. It is a brightly marked beast, more vividly painted than are our native rattlers of the Black Hills or Mount Tom. It is large and well filled out and has a keen eye for the stranger, whose approach to his cage seldom fails to call forth a shrill alarm. It is active, but naturally is somewhat cramped in its comparatively small quarters. It has made a few excursions, however; one a while ago to a meeting of the Boston Scientific Society, where he was let loose to crawl about the floor to show his curious oblique method of progression. Dr. Garman does not like, however, to take him into strange places, since a rat hole might afford him a safe retreat, and the chances of recovery in good condition would be very slight.

This beast seems to know his captor and makes no effort to strike him with his fangs, allowing himself to be handled with what seems like carelessness, but which is the skill born of long experience. He is more sedate than one of the younger specimens which was here a few years ago, which, while appreciating the warmth of Dr. Garman's hand and forming a coil upon it, was greatly incensed at visitors, and testified to this by vigorous rattling.

This Missouri specimen has yielded to science quite a number of interesting facts. He has been in his cage so long that it has been possible to follow step by step a number of his changes. It is known positively that he loses his skin twice a year, and that he adds a rattle for every skin. Instead of losing the rattles as he does his skin, they are retained by the closing of the inner end of the old rattle over the knob of he new one, and accidents excepted, the snake bears with him this record of his age. But accidents will happen. Through friction or for some other reason the horn which forms the rattle may become thin, and in such case, the catching of the rattle by some obstruction would tear it away. In this very snake some holes have now appeared near the base of the first loose rattle, and were the animal free in the woods, there is but little doubt that he might soon become a snake with a single rattle on his tail.

As to snake bites, Dr. Garman is in position to speak authoritively. He has had a great deal of experience, and has been bitten by all sorts of snakes. Most of them leave simply two little holes not more troublesome than the bite of a cat. The rattlesnake bite is quite different and requires immediate attention. The part bitten is relieved of the poison as much as possible by sucking, while the member is constricted by an impromptu tourniquet, which permits the poison-bearing blood to reach the heart only in mere driblets. And nature does the rest. There is a possibility that if the tooth should penetrate into one of the larger blood vessels, this treatment or any other might not be successful, but the chances are in its favor.

One may very readily inquire how it is that such a skillful snake catcher could allow himself to be bitten at all, but this is easily explained. In the instances in which it has occurred the bite was not from the snake that was caught, but from a mate which had not been noticed, but which, disturbed by the capture of its companion, struck at the common enemy.

But to turn a moment to Dr. Garman's investigation among the fishes, there are a number of points of general interest whose elucidation has been due to his persistent research. One of these concerned the artificial hatching of trout. It was found at the fisheries that a very large number of the fry were joined, two and two, like Siamese twins, and so large a number as to very noticeable. This was quite a puzzle to naturalists for a long time, for there was no evidence of its occurring in the brooks and natural hatcheries, and yet all the features of the hatching seemed precisely the same.

The female was customarily relieved of her eggs by gentle pressure, and these eggs were made fertile in the natural way, but nevertheless there was the peculiarity of Siamese twins, triplets and quadruplets. Why was it so?

Dr. Garman came at the solution a number of years ago, and his notion has since been general-

ly accepted. The perfect egg has a solid shell all about it, one point excepted, where the fertilizing particles are to enter into the egg and give it life. The natural deposisting of eggs by the female was an operation of some little time, and every egg had an opportunity to become perfect, and had only the one vulnerable point. With the artificial process, however, the eggs were discharged all at once, and naturally in different stages of completeness. In the less perfect ones, defects in the shell allowed vivifying particles to enter at two or more different places, and two or more embryos began their growth upon the same nucleus, which with later development became the curious twins.

But there is another discovery by Dr. Garman, a most remarkable one, which sounds like romance, that some fishes come in rights and lefts, for all the world like a pair of slippers, neither complete witnout one of the opposite kind. This is very new discovery, and it is very doubtful whether even all the fish men in the different museums have yet read about it, for the proof of it finds place in a volume of Proceedings of the Museum in Cambridge, hardly two months published.

The poet Moore in his researches in Persian lore, made one day a great find, and has translated for us a poetical description of

Sweet birds that fly together
With feather always touching feather,
Linked by a hook and eye.

These wonderful birds lacked each of them a wing, and so were not complete until they could find mates that lacked an opposite wing. This is a pretty fiction, and of course outside the bounds of possibility. But Nature is inventive even beyond the dreams of man, it is not possible to invent a form so curious that some one in a congress of naturalists would not be able to give the name of the organism that looks like it: The ridiculous drawings of great horrid fishes which the Chinese make for ns, which surely cannot resemble anything on earth, in the seas or in the water under the earth? But they do; and if one is permitted to examine the priceless pictures made by the hand of the elder Agassiz himself, which are preserved in one of the attics of the Museum, he will find that the great naturalist is quite in accord with the Celestial in the queer shapes which he has depicted.

These queer fishes which Dr. Garman has studied belong to the genus Anableps, the haunts of which are in warm waters from South to Central America. There are severnl odd things about them. In the first place they bring forth their young alive instead of depositing eggs in suitable places and leaving the rest of it to good fortune. In the second place they have a very curious eye; it is the exact counterpart of the divided spectacle lens which is so commonly in use, one half for far sight and the other for reading. This is literally true, the eyeball of the fish is divided into two portions by a black curtain, so that there is an upper half eye and a lower half eye. The division begins very early in the development of the young fish, there being first a little encroachment of the black border into the eyeball, ahd, having entered it, finally stretches clear across horizontally. So the fish has two half eyes in each socket.

Anableps is a fish of rather large horizontal proportions, and as he swims, his head lies partly out of the water, the water line being in fact just at the division in his eye. The upper eye he uses for vision through the air, seeking for food in the vegetables floating on the surface. The lower half of his eye he uses for vision through the water, and thus gets timely warning of the approach of his enemies.

One would think these oddities quite enough for a comparatively insignificant little fish, a few inches in length, and not making much figure in society, but it is this same genus which exhibits rights and lefts. The proof of this peculiarity depends upon close scrutiny and the dissection of the animal, but its anatomy leaves no possible question in the matter.

A right Anableps is doomed to wander about in lonesomeness through the seas filled with Anableps of his own pattern, and can never be happy until some opposite example, opposite in sex as well as one-sidedness, is found to share his home. And here comes in a most curious bit of statistics. Of the specimens which it has been possible for Dr. Garman to inspect, a number sufficiently large to be tolerably representative, three-fifths of the males are rights and two-fifths are lefts, while of the females, three-fifths are lefts and two-fifths rights. The three-fifths of the males that are rights will find in three-fifths of the females that are lefts most congenial companions, while the two-fifths males that are lefts will find a mate for each in an equal proportion of females that are rights. This balance in nature is by no means the least remarkable feature in the story.—*Boston Commonwealth.*

Needle Holders.

There is nothing nicer for dissecting needles than the crochet needle holders which may be procured from any store that deals in fancy goods. Common needles of any suitable size may be inserted and when the needles are broken or useless, new ones may be quickly inserted. These holders are inexpensive and will last a life time, while needles permanently mounted in handles when broken render the entire tool useless.—*The Microscope.*

The Largest Black Diamond.

This diamond weighs 3,100 carats, and is, therefore, the largest ever known. The Jagersfontein diamond, which was found in South Africa about two years ago, and which was said to be the largest in existence up to that time, weighed about 970 carats. The stone was found in the Carbon district, the old diamond field of Brazil. It is of the class known as "black diamonds," or commercially as carbon, which are used in diamond drills and for similar purposes, their color not adapting them to ornament.

At the present time the stone is in the hands of the jewelry firm of Kahn & Company, of Paris, and the Brazilian government is negotiating for its purchase for the National Museum. The stone was offered to Messrs. Bishop & Company, but they declined to purchase it, as it is difficult to say how such an exceptionally large stone will turn out when cut into commercial sizes, and the price demanded was too great. The value is placed by experts at between $30,000 and $40,000. The price paid for it by the present owners is somewhat uncertain, one account putting it at $26,000, while another says that they paid 52s. 3d. (English) per carat, which would make the price nearly $40,000, or not far from its probable maximum value.—*Scientific American.*

What is an Animal?

The title of this paper may sound somewhat paradoxical in the ears of not a few readers; and this for the simple reason that the ordinary and commonplace distinctions between animals and plants are in their opinion, both obvious and sound. Is there any liklihood, it may be asked, of our confusing a bird with the tree on whose kindly branch it perches? Are we likely to mistake the ox for the grass it crops? Or is there any relationship whatever, between the flower and the fair being whose person it may serve to adorn, and whose beauty it may enhance? True, the bird and tree, ox and grass, flower and wearer, are living beings. All possess life; and with this admission the likeness and relationship may be thought to end. There is no task, indeed, for the performance of which the popular mind may regard itself as being better fitted, than that of separating animals from plants. And any suggestion to the contrary, and which would hint that possibly we might experience some difficulty in framing an exact definition of one group or the other, would be naturally met with incredulity, and even scorn. Animals move, whilst plants are fixed; animals possess no leaves or flowers, whilst plants have both; animals have nerves and feel, plants exhibit no sensations. The form, the possession or absence of powers of motion, and the common attributes of the life of each group of living beings, thus serve, apparently, and in the most satisfactory manner, to map out with bold outlines the limits of the plant creation, as distinguished from those of the animal world.

Such is the philosophy of everyday life. Scientific philosophy, however, is forced to take a wider view of matters than can be obtained from the popular standpoint; and one result of a more comprehensive glance at the fields of living nature is to throw very considerable doubt on the validity and worth of the common modes of separating animals and plants. The popular ideas deal with the higher forms of animals and plants, and concern themselves with the separation of what may be seen with the unassisted sight; and with characters in animals and plants that can be discerned without any exercise of skill. But beyond the visible world lies a universe of life, invisible save to the eye of the microscopist. Other worlds than ours rise at his beck and call—worlds peopled with beings so diminutive that their dimensions are estimated by standards compared with which a hair's-breadth is to be esteemed gigantic. In these regions of the infinitely small there are included beings the exact nature of which, we shall presently see, it may be hard or impossible to discover. But even within the visible portion of living nature which exists around us, there may be much on which the far-seeing glance of science rests that is dubious and uncertain. It may be shown that in many cases the common distinctions between animals and plants are utterly valueless when applied to the classification of some tolarbly well-known forms of life. The whole question before us is one which has grown out of the increasing research of modern times; the advances of modern science thus resulting in the demonstration of our ignorance of many of the fields of inquiry which lie before our gaze. And in what follows we shall endeavour to show, not merely that the task of separating some animals from some plants is attended with great difficulty, but also that it may be impossible to declare, in the present state of our knowledge, what are the essential characters of the animal, and what the unmistakable features of the plant.

A simple experiment in the production and development of some lower forms of life, will serve as a starting point for our inquiries into the special characteristics of the two great groups of living beings. Some chopped hay is put in a vessel, and through the addition of some water an infusion thereof is made. This infusion is further allowed to stand freely exposed to the air for a week or so, and at the expiry of that period we place a drop of the liquid under a microscope of high power. Then a wonderful sight bursts upon our view. The fluid which the ordinary observer might have expected to be turbid from the presence of particles derived from the dead hay, is seen literally to swarm with life. Rushing hither and thither across the field of the microscope are numberless specks, which our first glance assures us are living beings. When the eye has had time to become better acquainted with the scene on which it rests, it may assort or parcel out the organisms of the infusion into various kinds or grades. There, for instance, are minute rod-shaped bodies which wriggle about with an ill-defined, jerking motion. These are *bacteria*. There, again, are bodies of different form and larger size, which appear to consist of a number of the rod-like bacteria united, end to end, and which the biologist names *vibrios*. But we also discern bodies which are different from either of the organisms just mentioned, and which attract attention from the rapidity of their movements as they flit hither and thither like swift vessels through their miniature sea. Stay; there is one of these active bodies which has come to rest for awhile, and which permits us, luckily, to obtain a better view of its form and nature. You notice it to be pear-shaped, and if you are capable of forming an idea of the size of the minute objects with which the microscopist deals, you will not be surprised to learn that the body you see before you measures about the three thousandth part of an inch in length. This pear-shaped speck bears at its narrow end a long tail, formed of a filament which we may compare to a miniature eyelash, and which has been named a *cilium*. By more careful observation we might see that a second ball, or cilium, was present, and that this latter appendage was also attached to the slender extremity of the body. The body itself presents few or no features for remark. But if we are fortunate in our selection and manipulation of our specimen, we shall be able to see within the body a clear round space, which ever and anon contracts itself with a jerk and disappears, only, however, to reappear witb its clear surface as before. Now the creature is off again on its pergrinations, to add one more unit to the hustling and jostling crowds which people the drop of water before us. You are able, as it moves, to see that the longer of the two tails, or ciliæ; serves as a kind of propeller, whilst the second tail exists behind; and you may sometimes observe the creature to anchor itself by the second cilium, and then spin round and round the fixed point like some curious top of vital construction. Then it releases itself, and is off again on its wild career—jostling its friends and neighbors in the struggle for existence in which animalcule and man appear alike to participate.

(TO BE CONTINUED.)

PENIKESE—A Reminiscence.

By One of its Pupils.

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Professor Agassiz lectured to us every day, and sometimes two or three times a day. His suggestions to us in our study of the Animal Kingdom and upon embryology were also of the greatest interest and importance. At one time he tells us:—

"We begin, today a course of lectures on the Animal Kingdom. To know how the knowledge was obtained we must study the history of Zoology. There was a time when animals were studied by their external features alone, and scientists knew so little about classification that they arranged their information alphabetically. One of the earliest scientists to which we refer today was Caspar Gessner (this should doubtless have been Conrad Gesner, though it is Caspar Gessner plainly in the notes taken at the time the lecture was given). The first classification of animals was into aquatic, aerial, and land animals. Aristotle was one of our earliest and best scientists. Linnæus' *Systema Natura* is a marvelous work, considered from our greater and his lesser knowledge of the subject of which he treats. The period of Cuvier is as remarkable as that of Linnæus. He introduced anatomy as the basis of classification, (there were three editors of his *Regne Animalia*, in 1817, 1829, and in 1834). Contemporary with him was Carl Ernest von Baer. He studied embryology and arrived at the same conclusions. He gave to the Animal Kingdom four classes. Dollinger was the founder of embryology. He was great as a guide to further labors, —Baer was his pupil. Sanders' *Embryology of the Chick* is an important work for students in embryology. Ostroeicher's studies on the capillaries were written under Dollinger's directions. Oken wrote from suggestions made by Goethe. The elder Carus and Geoffrey St. Hillaire works contained the studies of homologies,—the latter is now a most important work for the continued advancement of Zoology. Will someone explain the difference between analogy and homology? Of embryology as a study in itself Professor Agassiz said: "It is a wonder that such broad and comprehensive generlizations could have been made upon a basis of knowledge derived from so few animals."

Again, he takes up embryology and says:—

"The eggs of birds were known, and their parts named, very early; these have been transferred to all other eggs. We have the yolk, with its vitelline membrane; the white; the shell with its two lining membranes with the air space between them at the larger end; and the suspensory cords. Of all these the yolk alone is necessary in producing the young,—in fact, the others may *all* be wanting. Eggs can be of any form. The yolk is a fluid, organized, and at first appears albuminous. The *blastoderm*, or life portion, is surrounded by a congregation of light cells which cause it to always appear on the top—no matter how the egg may be placed. Baer discovered the mammalism egg, and about the same time, 1837, the cell doctrine was advanced. Through the influence of Schleiden the structure of animals and plants began to be compared. Studies of cells and the cellular structure has been continued ever since. They described the cell membrane, the *nucleus* or point of special life, and the *nucleolus* or point within this point. Microscopists sought cell tissue everywhere. Embryologists sought the smallest eggs. All parties agreed, finally, that eggs were cells destined to an enlarged growth—a peculiar development and, ultimately, an individual existence.

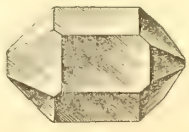
"Forty years ago the theme of science was the function of organs: Today, it is cells. The minute tentacle of the hydroid polyp contains, at once, cells —nervous, muscular, and assimulative. Thus all structures are formed of differentiated or specialized cells; all parts of animals are formed of cells. The study of the changes undergone by these cells has only just begun. Until we know how new individuals originate we cannot speculate upon the origin of species. With a power of 1100 diameters we see, in these minute eggs, small dark spots in the stroma. We know nothing of the properties of these bodies. All we can tell is that dots of all sizes may be seen, hence we conclude that the dots grow. In the larger dots we notice a difference between the periphery and the center, the latter being less dense. Next we see a central condensation. Later a mere hollow until we get a perfect nucleus. Finally, one or several germinal dots,—and we have the so-called ovarian egg of the embryologists with which they begin their investigations."

Well do I remember how often Professor Agassiz urged us to "read only the best books." He seemed especially fond of Cuvier's works, and time and again impressed it upon us that they were a "most valuable basis for scientific study." Among his odd table-talks—for he often talked to us from the breakfast, the dinner, and the tea table—and even many other times, in the laboratory, and anywhere where that he could find an object to talk about and a group, of two or three, even, to talk to. "Be sure" he would say, "to examine all protozoa which you may secure, to see whether they are independent individuals or different stages of the same individual." In urging a study of Physical Geography, he would add, "for a knowledge of Physical Geography is indispensible to any student of Natural History." He heartily indorsed Professor Guyot's works upon that subject. There were few books he *did* recommend to us, for he cordially detested the ordinary books upon scientific subjects. At one time, in a paroxysm of rage at these "would-be scientists," he exclaimed: "they are mere compilations of persons unfamiliar with science, who mix the false and the true:" Alas, shall we ever again meet with his equal, as teacher and pupil and brother combined!

To one unacquainted with Professor Agassiz, the scenes at Penikese, during the second term of her school, was full of fascination and lively animation: but to us, who had studied under the Master, it was one with "the whole head sick, and the whole heart faint."

In presenting the history of this *second* and *last* year of Penikese Island, if I have followed my diary somewhat closely, and thus of necessity repeated many things that had already been said in any previous chapter, I hope that they will not appear objectionable on such account—since they may introduce us to new features of the original plan, and lead us to new pleasures in the inexhaustable field of research.

(*To be continued.*)



PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

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FRANK H. LATTIN, Albion, N. Y.

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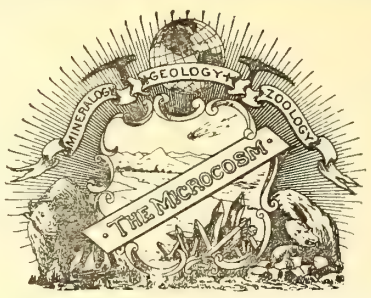

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NATURAL SCIENCE NEWS

VOL. I. No. 42. ALBION, N. Y., NOVEMBER 16, 1895. Weekly, $1.00 a Year

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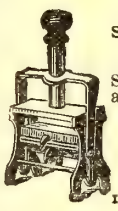

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Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

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Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
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Natural Science News.

VOL. I ALBION, N. Y., NOVEMBER 16, 1895. No. 42

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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What is an Animal?

CONTINUED.

Such is a brief description of a sight well known to every student of the microscope, but which, despite its familiar nature, can rarely fail to evoke interest and to serve as the exciting cause of a laudable and scientific curiosity. What is this creature which is seen to be represented by its thousands in a drop of hay-infusion? The popular idea that power of motion is the exclusive right of the animal would unhesitatingly declare that the creature falls under the paternal care of the zoologist. But the man of science would reply that whilst the *Monads*, as he terms these creatures, *may* be animals, he sees no adequate reason, on the other hand, for refusing assent to the statement that they *may* be plants. Let us try and examine the question somewhat in detail, and place ourselves in the position of a counsel whose aim it is to convince a jury (of readers) of the impossibility of drawing definite distinctions between the animal and plant worlds, or of saying absolutely regarding any organism "That is an animal" or "This is a plant."

The opposing side begins the trial of the cause by asserting that animals move, whilst plants are fixed, and that because our monad moves, it must therefore be regarded as an animal. Very good. Let us accept this first point for what it is worth, and judge it on its own merits. Our opponents, it is clear, are keeping the higher plants and higher animals exclusively in view. But they must remember that our aim is not merely that of separating the higher animals from the higher plants, but of constructing an *absolute* definition and idea of an animal and of a plant. If our definitions are to be of any service whatever, they must include in their scope *all* animals and *all* plants. And as our opponents will readily admit this reasonable demand, we proceed to adduce evidence against their first proposition—namely, that motion is an unfailing characteristic of the animal. Firstly, let us consider whether all animals move, and whether all plants are fixed. What shall you say of the coral-polyps which are not merely rooted, but which in their strong investments appear to posses solidity, in addition to fixation of body? What can be said of the sponges, now proved to be true animals; or of the "zoophytes," which grow rooted and attached from the oyster-shells and stones brought up from the depths by the oyster-dredger? And in rddition to these examples of rooted animals, might be mentioned the "sea-squirts" or *Ascidians*—related somewhat to our shell-fish—the sea-anemones, the *Polyzoa* or "sea-mats" and many other truly animal forms of by no means the lowest grade. But even if it be said that the sponges, corals, sea-anemones, and sea-squirts are free and active in the young and juvenile stage of their existence, this may be fully met on our side by the mention of the curious fact that not only do many lower plants swim freely about in their young state, but some are actually free-swimming throughout their entire existence. A sea-weed begins life as a little free-swimming speck propelled through the sea by cilia, similar in nature to those of the monad. Other lower forms of plant life, exemplified by many microscopic plants that attach themselves to water-weeds, and which are composed exclusively of cells, may be seen to liberate the living matter of these cells in the form of little free-swimming particles. Each particle is termed a *zoospore* by the botanist, and were you to see it swimming side by side with your monad, you would experience extreme difficulty in distinguishing between the two organisms—if, indeed, you could separate them at all. And if bodies indistinguishable from the monads are thus seen to arise from true and undoubted plants, why may not the monad be a plant? Moreover there is one notable plant which does not appear to be fixed at any period of its existence. Such is the *Volvox globator* or "Globe Animalcule," as it was formerly named, under the idea that it belonged to the animal creation. To see this organism rolling over and over upon itself, in company with the animalcules you have obtained along with it from a stagnant pool, is a sight which goes a very great way in convincing one of the futility of advancing power of motion as a means of distinguishing between animal and plant life. Notwithstanding its mobile life, the the Volvox is a true plant, made up of an aggregation of little monads, each of which, like the monad we first saw, has a pulsating space, and two cilia for locomotion, but, in addition, containing *chlorophyll*, or the green-colouring matter found in plants. And it is a noteworthy fact, that the oid division of the infusorian animalcules, as defined by Ehrenberg, has long since been resolved into a multitude of separate and distinct organisms. Many of the so-called "animalcules" of this observer are now known to be merely the locomotive and young stages of lower plants, and some of the "animalcules" of tolerable recent year—such as Volvox itself—have been ascertained to be true plants of adult kind.

Thus, it may be held as proved, we think, that power of motion *per se*, is a characteristic of little or no value in drawing lines of demarcation between the animal and the plant. We may pronounce the same verdict on the distinctions which are commonly drawn from *form*, and from the general shape and configuration of body. Unquestionably, were the higher animals and plants the sole subjects of remark, this latter method of separating them would be found efficacious and trustworthy. But recollecting that we must include all animals and all plants in our definition, we see that amongst the lower forms of life there exist many organisms which, as far as mere form and appearance are concerned, might belong either to one

or other group. Our monad is exceedingly like many Infusorian animalcules, but it just as closely resembles many lower forms of plant life. Nor is this confusing identity of forms with plants, peculiar to lower animals alone. Here is an organism we have just picked up on the sea-beach. It appears to be a piece of pale brown sea-weed, it is almost invariably preserved in herbaria by seaside visitors, who most laudably unite a study of nature with the labour of holiday-making. In dredging-expeditions you obtain specimens of the same organism growing rooted to oyster-shells, and to stones, and as you behold it thus attached, you might have little doubt left that you had fished up a marine plant from the sea-depths. But scan the surface of this *Flustra* or "Sea-mat," as it is called with a pocket-lens, and you will see that it presents a very regular division into cells, which crowd both surfaces of the organism. Or, better still, examine a bit of living Flustra, microscopically, and then all of your ideas of its plant-nature will be ruthlessly dispelled. For you then see that from each cell of this supposed sea-weed comes forth a little crown of tentacles, forming the "head" of a little animal, which, were your anatomical skill more advanced, you might demonstrate as possessing a mouth, stomach, intestine, and other belongings of the animal world. The Flustra, in short, is a colony of animals, numbering its population by hundreds, but which nevertheless, grows by budding, and in the strange verisimilitude of a plant! Nor is the Flustra singular in its mimicry of the vegetable world. On the sea-shore you may pick up dozens of specimens of equally curious animal organisms, collectively known as "zoophytes," and which mimic in the most exact fashion the forms of trees and shrubs. The well known *Sertularians* or sea firs get their popular name from their resemblance to fir trees; other species mimic shrubs and vegetation of more irregular shape, and with spreading branches, deceive the seaside visitor into thinking they are the waste of marine forests. Each zoophyte, again, is simply a colony of animals, of lower rank than the tenants of the Flustra-colony, but, like the latter, growing in the exact likeness and fashion of plants. Thus, the assertion that the *form* of the animal is always characteristic must fail equally with the statement regarding the value of the power of motion in distinguishing the animal from the plant.

But, it might be asked if chemistry, with its fertility of resource, with delicacy of experiment, and with almost endless analytical powers, is unable to select any substances, the possession of which would form an unfailing characteristic of either group of living beings? To this question a negative answer must be given. Cuvier, the celebrated French naturalist, affirmed that the element nitrogen was peculiar to animals; but this statement has, years ago, been proved to be utterly erroneous, and all other attempts at the purely chemical separation of animals and plants have likewise failed as our knowledge of organic chemistry has progressed. The living substance of animal and plant bodies is seen to be essentially identical. It consists of the matter now well known under the name *protoplasm*; and the farther back we trace the life-history of animals and plants, the more confusing in their chemical composition do they become. So that the living substance found within the cells of plants, and of which the bodies of the lowest animals are formed, and that of which the germs of high and low animals are alike composed, is seen to be identical under the strictest examination of the modern chemist. Thus, whatever differences in form, in chemical composition, or in other points, are afterwards evolved, there exists a perfect identity in the young condition of animals and plants, in respect of the composition of the living matter from which they are formed.

(TO BE CONTINUED.)

Natural History at Atlanta.

The exhibit of the U. S. National Museum in the government building at Atlanta is intended, in the language of the catalogue, to convey to the mind an impression similar to that received by visiting the Smithsonian buildings in Washington.

Most of the objects exhibited are from the collections of the U. S. Museum, and are so arranged as to give a good idea of the character of the treasures therein preserved, besides illustrating the methods by which animals are studied, classified, arranged, labeled and displayed in a great museum.

The first department represented is that of mammals. Here the various types of mankind are shown either by figures or portraits, the bright costumes of some of the figures being very striking. Twelve of the most characteristic types of the human species are thus shown. Groups of Rocky Mountain sheep, Rocky Mountain goats, prairie wolves, armadillo and American badgers are also exhibited.

Next in order are the birds, of which six cases are exhibited. Five of the six cases contain groups, by far the most instructive and attractive way to show these subjects. First are the bower birds, fitted up with a play-house such as they construct in their native wilds in Australia. The bower is constructed of long twigs, brought together above and below, forming a cylindrical runway. This is decorated with bright feathers, shells, bones, buttons—when they can steal them from the natives—and other subjects.

The second group represents the lyre bird and its curious dancing mound. The third group is that of the American flamingoes, showing the construction of nest and the manner in which the bird sits upon the eggs. This is a very showy group. Next are the long and slender-toed jacanas from Mexico, whose peculiar habit of walking upon the broad-leaved aquatic plants is here illustrated.

The fifth group, "The Interrupted Dinner," appeals strongly to the mind of every lover of the gun. A red-tailed hawk in the act of feasting upon a recently caught grouse is suddenly set upon by a goshawk, and is mounted with claws in air trying to keep the marauder away.

The last case of birds contains a fine collection of the birds of paradise from New Guinea. About thirty kinds of these birds, so remarkable for beauty of plumage, are shown. Some of the specimens are very valuable, and the exhibit, though not so large, is well worth going to see.

The snakes are represented by such well-known friends as diamond rattler, banded rattler, prairie rattler, copperhead, harlequin snake and water moccasin. The poisonous snakes of the United States thus brought together in a group make an interesting exhibit.

Next are shown representatives of seventy-two families of American fishes. These are preserved in alcohol and exhibited in flat-surfaced jars.

Next we come to the department of anatomy, where interesting

structural developments of various animals are to be seen. By the use of specimens and models some of the internal secrets concerning the development of embryo, skeleton modifications, etc., are to be seen at a glance. For instance, under modification of the skeleton for locomotion is shown the kangaroo, the ape, the sloth and the dude (mentioned in the order of their value).

Among the marine invertebrates are to be seen many pretty objects, both dried and in alcohol.

The department of mollusks exhibits a case of showy shells, and must not be overlooked.

A very fine exhibit of insects is made, the popular portion being eight frames of beautiful *Lepidoptera* and *Coleoptera* (butterflies, moths and beetles), gathered from the four quarters of the globe.

Passing on, we come to the fossils; next the geological exhibits; then the minerals, and on to the ethnological. Here we see many things of interest pertaining to the life of the sons of the great American forests and plains.

That the Smithsonian and National Museum exhibits at Atlanta will instruct the people drawn to it by its attractiveness cannot for a moment be doubted; the educational values of great museums cannot be computed, and the unstinted evidences of hearty appreciation of the Government display by the President of the United States and the members of his cabinet during the recent visit to the Atlanta Exposition was fully merited.—*B. A. Bean in Forest and Stream.*

How to Interest People in the Microscope.

It may be that some of the readers of *The Observer* have become discouraged in attempts to interest their friends in what is wonderfully beautiful to themselves, and I presume not a few have felt a wave of disgust pass through their souls as the friend, earnestly trying to seem appreciative, and feeling a necessity to liken the vision to some known object, has remarked its close similarity to a meeting-house, a bit of lace, a strainer, a pine tree, or a dog's tail. It is a fact to be borne in mind, amid these and kindred trials, that the eye must be trained before it sees correctly, and this is particularly true in the present case. The skillful microscopist is in danger of forgetting his own difficulties with his eyelashes the first time he looked through the tube upon the brilliant background and saw something glistening in the light. We do not ordinarily hold what we are looking at against the light, and this is one reason why a new observer is so dazed when he looks into the microscope. With all due regard to the good judgment and common sense of the one who fails to interest his friends in the microscope, let me say the failure is generally due to either a wrong choice of objects, or of the time selected to display them. Of course a novice with five minutes to catch a train, will not give much intelligent notice to a slide division of nucleus in the hair of Tradescantia, but he might take one glance at a flower seed, and remember while on the train how prettily Nature has wrapped up the embryo poppy.

Then there is another thought concerning the introduction or preface to the display. We all know that one who has heard anything highly praised in advance, rarely deems it worthy of so great praise when he sees it. It makes little difference whether it be a landscape, a work of art, or a microscopical slide. The one exploring should have the right of making his own discoveries of beauty, and rejoicing in them in his own way, however unconventional. If he likens the object to some incongruous thing—his case is not hopeless. Every one of us may be placed in a position where we cannot speak the proper language used by those at home in it. Therefore explain all that is needed, and then wait, and cordially welcome the expression of wonder or pleasure, and your reward shall be that you have won the interest of your friend.

There must be judgment exercised in the selection of objects. This will involve considerations of the age, information, and tastes of the one you wish to please, as well as the length of time advisable to be taken. Often a single object well shown is better than more—because it leaves a perfectly clear picture in the mind that is instructive to recall. Keep closely to the simple things that are easily understood and have no complicated structure.

There should be nothing to shock or disturb the observer, so you must be considerate of his natural prejudices, and however much you may enjoy the dissection of worms or the comparison of cheese mites with sugar mites, or abnormal tissue with normal—be sure the average spectator will shrink from the sight and feel uneasy over the next meal. (I would like to say all I think of the evil done by blundering people in this line.)

Confine yourself to low powers until your friend has mastered the matters of focus and moving the object on the stage—and then use high powers sparingly. Remember that the greater magnification is obtained at the sacrifice of a larger field, and that it is always best to show as much general relation between the parts of the object as is possible.

Children are fond of looking at small insects, wings, feathers, seeds, moss, sand, etc., and it is quite safe to expect that older people will enjoy them as well. With adults, however, the difference will be noticed, more attention can be given to the details, and particularly to the adaption of parts to the use for which they are made. Also the maturer mind will take pleasure in observing the similarities or differences between two or more closely allied objects.

Generally speaking, a lady will be interested in botanical subjects—pollen, sections of leaves or stems, with their various forms of cells and their contents, but it is the man who will give the sections of wood the closest attention. If your friend is aged, be considerate of the eyes that have passed their prime, but never allow him to feel that he cannot enjoy the pleasure the others are receiving.

Put on the stage an object that has both thickness and color, as crystals of bichromate of potassum, or sand—or a flea—something that will not be difficult to get a focus that will show satisfactorily even if it be not the best. Encourage him to remove his glasses and take time to adjust the focus to suit his eye, and the sincere delight which he will show when he finds that he can see as well as the others, will make you patient when the next one declares that it is no use in his trying to see.

Do not forget the children of the poor—or the very ignorant. A simple thing which I never knew to fail to draw attention is a fine handkerchief placed over the stage—and having caught their interest it is easy to go on, and one can never know but it may be an incentive to some waif to struggle up into greater knowledge and light. — *Ella M. Drury, Boston, Mass., in The Observer.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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CHAPTER VII.

Second Year at Penikese; Laboratory Work, More Lectures, Familiar Daily Scenes, Recollections of Agassiz, Theodore Lyman on Fish Culture.

Just one week upon the island, and though we have had plenty to do the time has passed quickly and pleasantly enough. There are, of course, a variety of employments, and no one is confined exclusively to any one thing all the time. You will see some in the laboratory busily employed in the dissection of fishes or other animals. They carefully trace, from origin to terminus, each organ—however minute—and accurately determine its relation to the other organs and to the surrounding parts of the animals. Then the nerve systems are followed through their various courses to their seat, the brain, which is laid open and shown in all its perfectness. Finally, the veinous and arterial blood systems, injected (to show their finer terminal portions) or not, followed with slowness and with the utmost precision, teach the student lessons which they can never forget. On shelves, in our laboratory, will be found carefully selected and prepared specimens of these dissections, and the digestive organs of various species, all neatly tied and snspended in alcohol. Only one week upon the island yet we have laid out work enough for a year's hard labor already,—but we came here to work!

Others you will find at work upon some minute, and often microscopic, dissections of the common clam or mussel. Here our injections do a most beautiful work. Different coloring materials are mixed with gelatine, and, while yet warm and in a liquid state, are introduced into every vein and artery, while every fibre responds; then the whole cools with a hard, fast color.

Still others are busy over beautiful sea mosses, and the minute and delicate polyzoa and protozoa with which they abound. Professor Bicknell has a class in microscopy, and Mr. Alexander Agassiz will, as soon as his health permits, give instruction about sea animals, such as the medusæ, starfishes, sea urchins, jelly fishes, etc., and also in embryology.

The aquariums are not all as yet in full running order,—though many of them are already well-filled with sand, stones, sea-weeds, and a goodly number of specimens that are especially adapted to live and thrive in such confined quarters, and represent quite fairly the animal life of the surrounding waters.

One of our students has recently secured and placed in his tank, one of those most beautiful, delicate, and altogether wonderful little animals, so rare upon our coast, the *physalia*—often called the Portugese Man-of-war, or the *Physalia arethusa* of the scientist. It is an exquisite little beauty—a dainty, fragile gem—and belongs to the class of *Acalephæ* or Jelly Fishes, of the order *Hydroidea* or Hydroids, which are also known by the name of *polyps*, from two Greek words signifying "*many-footed*", referring to the *tentacles*; which were, doubtless, in olden times supposed to be feet,—and, apparently, not without reason, since *tentacle* is from a Latin word signifying "a feeler,"—and many of these lowest forms of animal life have no feet but their feelers which must thus have originally been supposed to be feet, both from their shape and from their appearance. One little animal, therefore, has quite a history of its own. Of late years, scientists, who delight in changes and lengthy names, have classed it as: Branch III (of the animal kingdon), *Coelenterata;* Class I, *Hydrozoa;* Order III, *Siphonophora;* Genus, *Physalia;* Species, *Arethusa.* Now these long names are apparently meaningless to the majority of mankind, but as we have no specimen before us, let us try, through the medium of the "*dead* languages," a little induction *a posteriori*, and discover, if we can, *what* our specimen is really like. So we procure the Greek and Latin lexicons, and begin our work. With a little difficulty, we find that our first hard name, *cœlenterata*, is derived from two Greek words, (*koilos* and *enteron*) signifying "hollow-entrailed;" this then lets us into the characteristics of the animals of the branch—that is, their internal organs are, in a great measure almost wholly wanting, or, if present, of so simple a nature as to perform the functions of digestion by means of a bag-like stomach which digests principally by assimilation. Our next word, *hydrozoa*, is quickly found; the "*hydra*" or famous many-headed monster, or serpent slain by Herclues, standing for the first part of the word; and "*zoon*" (or zoön as it is often written), the Greek word for an animal—this gives us the key to our class characteristics. The third word, *siphonophora*, is still more plain, being derived from almost identical Greek words signifying a "tube" or "siphon," and "I bear" or "bearing." The word *physalia* comes from a Greek word, also very similar, which signifies "a bubble." *Arethusa* was the name of a beautiful nymph of Diana's: she was afterward changed into a fountain.

At first sight, the Portugese Man-of-War would put one in mind, as the name suggests, of an immense oblong, somewhat egg-shaped, bubble of air, with a crest of wavey, wrinkled crenules, much thicker than the surrounding parts, spanning its top and extending to its attenuated ends; the whole an iridescent or burnished purple, with reflections of an hundred kindred colors. But, while this delicately shaped and gorgeously tinted little animal rides gracefully along upon the top of the water, dancing merrily with its ripples, we suddenly become aware of an hitherto unseen dense bunch of what resembles a mass of sea-weed, of fine, crinkled hairs and threads, some of which extend far down into the water. We examine it closely—perhaps touch it with our hands. It stings us with an electric stroke that makes us feel as if our whole hand had become suddenly alive with a fiery infusion of nettle, which remains for nearly half an hour. The bubble itself, to this wonderful, composite animal, is four to six inches in length and some three wide and high in its centre. The bunch of living polyps beneath, twice that size; while the ravellings, for such they seem to be, hang downwards to from twelve to eighteen inches below the clustered mass above, Now this assemblage of living individuals must be studied separately from the bubble, as we will still call it. Investigation proves that this is not a single individual, as would at first appear, but a colony of innumerable zoöids, carrying above them, a huge wind bladder—apparently, only to sustain them just below the surface of the water. The true home of this living, floating island is in the Gulf of Mexico. It must, therefore, only casually drift so far north as its present limit—which is rarely beyond Cape Cod. Three specimens, only, were found during our stay at Penikese, of which, I believe, I alone

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

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Have received orders from every State in the Union as well as from Germany, England and Canada."

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AUGUSTA M. FOOTE,
WARREN M. FOOTE,
Executors for A. E. FOOTE, Deceased.

1226 North Forty-first St.,
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October 22, 1895.

Natural Science News.

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In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

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We are now putting up Florida Sea Shells and Curios in beautifully turned and polished **Hard Wood Boxes;** thereby saving to our customers freight or postage on a worthless case.

These boxes are hand turned from beautiful Florida woods, such as Orange, Lemon, Florida Mahogany, Cedar, Button Wood, Red and Black Mangrove, Palmetto, Spice Wood and many others.

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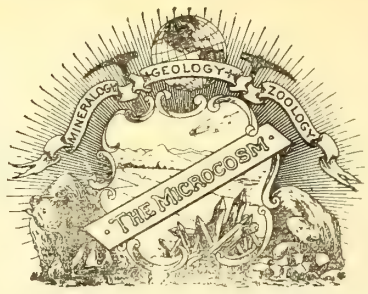

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THE BURROWS BROTHERS COMPANY.

[*As the above letter is of no small amount of interest and thinking that some reader of the N.S. NEWS might be glad for an opportunity to purchase this extremely rare and valuable set of "Audubon's" we print the letter in its entirety.*—ED. NEWS.

NATURAL SCIENCE NEWS

VOL. I. No. 43. ALBION, N. Y., NOVEMBER 23, 1895. Weekly, $1.00 a Year

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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Indigo Bird, blue	$ 85	$.15
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All mounted specimens placed on stand or perch. Those marked with *star* sent by express at purchaser's expense unless 35 cents extra is enclosed with order. All others sent *prepaid* at prices quoted. Address,

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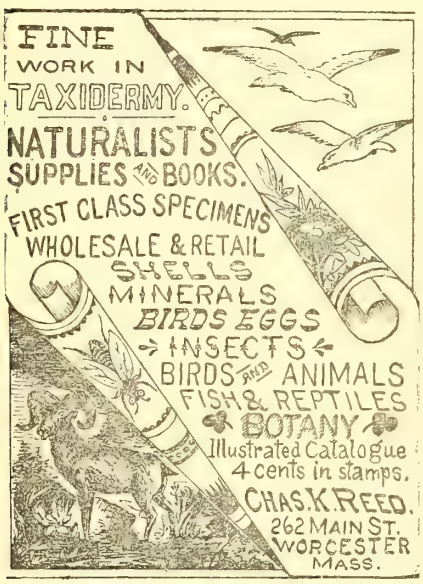
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00



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Natural Science News.

VOL. I ALBION, N. Y., NOVEMBER 23, 1895. No. 43

Natural Science News.

A Weekly Journal Devoted to Natural History.

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What is an Animal?

CONTINUED.

It might also be shown that some substances long regarded as belonging exclusively to plants are now known to be manufactured as natural products by animals. The *chlorophyll*, or green colouring-matter of plants, occurs in many animalcules—this fact rendering the identity of many of the lower forms of life more and more confusing—as well as in animals of higher grade. And a starchy substance known as *cellulose*, of which the walls of plant-cells are composed, is found abundantly in the outer layer or covering of the bodies of those Molluscoid animals named "Sea-squirts" or Ascidians. Sugar and starch, known to every one as vegetable products of characteristic kind, are now ascertained to be manufactured in a perrectly regular fashion by animals, which, as it would seem, are bent on the close imitation of the character of plants. And stranger still, it would appear that the chemical and vital processes of animals are imitated by plants; for it has been known that in the developing seed of a vetch there exists a principle, or "ferment," as it is called, allied to the "sweet-bread" juice or pancreatic secretion of animals. By means of this secretion, the young plant as it springs from the seed is able actually to "digest" the starchy and nitrogenous matter within its reach. The digestion of flies by the "Venus' fly-trap" (*Dionœa*) and by the Sundew (*Drosera*), as described in another paper, also illustrate the imitation of the animal processes by plants.

And just as the chemist increases our difficulties by showing us the similarity in substance of animal and plant bodies, so also does the microscope fail us when we apply to him for aid in separating the two groups of living organisms. If animals and plants are to be regarded as alike in composition, they are no less similar in essential structure. Place the tissues of animals under the microscope, and they are seen to be composed of the minute bodies to which the name of "cells" is given. Examine plant-tissues, and "cells" again appear as the units of which the plant as a whole is built up. And once again, if the lower animals and plants be microscopically compared, their substance, which defies separation by the art of chemistry, equally defies divorce at the hands of the microscopist. The protoplasm of lower animal and plant bodies is literally indistinguishable. If the germ of the higher plant, and that from which the higher animal springs, be examined by the microscope, the differences which become so apparent in after life are seen to disappear in a primary resemblance, so close in all points, that the task of separation appears simply hopeless.

It may now be said that, granting that the futility of the foregoing methods of scientific examination in enabling us to say wherein lie the essential features of the animal and the plant, the presence of nerves, and the power of receiving and of acting upon sensations, might be regarded as a characteristic of the animal as distinguished from the non-sensitive plant. But in a previons paper it has been shown that the Venus' fly-trap, the sensitive plant, and other plants are highly sensitive; and we then advanced reasons in our opinion of greater force than any that may be given to the contrary, in support of the proposition that sensation was universally diffused through living nature. Wherever the primitive life-substance of protoplasm exists, it may be held that there sensation is present—lowly developed it may be, but still undoubtedly manifested, as we may see when we regard the movements in the cells of lower plants or the better defined acts of animalcules. The arguments for the universal recognition of sensation as an invariable concomitant of life itself are both reasonable and well-founded on theology.

The assertion that animals may be invariably known by the possession of a mouth and stomach is disproved by the consideration that many parasite animals—for example, the tape-worms, the male "wheel-animalcule" or *Rotifera*, and many animalcules—are destitute of, it may be, the veriest rudiments of a digestive apparatus. The animal commissariat in such cases is conducted essentially on the principles of the plant; such animals in most cases living by the absorption of fluid matters in the absence of an alimentary system. It may be admitted that it is a characteristic of most animals that they can feed on solid matters, and as a rule on *living matter* only; whilst their plant-neighbors, are compelled to subsist on "slops"—that is liquid and gaseous food, or *inorganic matter* derived from the soil and atmosphere; the liquids, however containing solid matters in solution. But there are some lower plants allied to the *Fungi*, which present us with exceptions to these latter rules. Many parasitic plants feed on the juices of other plants—that is, on living matter. And what shall we say of *Æthalium*, the so-called "flowers of tan," a fungus growing in tan-pits, which not merely begins to exhibit independdent movements at certain periods of its existence, but at these periods appears to subsist on solid food, like a veritable animal? Thus even a single example—and *Æthalium* is not alone in respect of its singular habits—may vitiate a distinction, which, as applied to the generality of plants, is of sufficiently stable kind. Connected with the subject and question of the *food* of the two groups of living beings, is that of the gases necessary for the maintenance of animal and plant life respectively. Every one acquainted with the merest rudiments of human physiology know that animals require a due supply of *oxygen* for the maintenance of their vital functions and that plants, on the other hand, demand *carbonic acid* as their gaseous food. Could this rule be

"made absolute," as the lawyers have it, the test of the exact nature of a living being might be referred to the capability of the former to inhale oxygen and to emit carbonic acid, as a part result of its bodily waste. The plant, on this showing, might conversely be known by its power of reversing this operation, and by its inhaling carbonic acid and giving out oxygen as the result of its vital chemistry.

But is it true that all plants absorb carbonic acid gas and inhale oxygen? Let us refer the matter to the chemist and botanist as arbitrators, and let them detail the results of their experiences. As you walk in a garden on a bright summer's day, your eye is pleased with the grateful green of the vegetation around. The botanist tells you that this green colour—of all hues the most grateful and refreshing to the human eye—is to be taken as a test of a plant's capacity to subsist on carbonic acid. Wherever you see a green leaf—no matter whether it forms part of a stately tree, or exists in a lowly blade of grass—the botanist will inform you that there the great operation of plant life may proceed; and that within the leaf-tissues, carbonic acid gas, through the exercise of tbe vital chemistry of the plant, is being split up or decomposed into its constituents—carbon and oxygen. The carbon, he will further tell you, is retained by the plant to serve for food, whilst the oxygen is liberated and passes back to the atmosphere to afford food to the animal. But our botanical friend would also inform us that before the green colouring-matter can thus decompose the carbonic acid, it must be subjected to the action of light. Light forms, in fact, the second condition required for the performance of this chemical act on the part of the plant; the presence of chlorophyll being the first condition. What, then, will happen when the daylight fades, and darkness falls on the plant world? His reply is that in the dark the green plant becomes an animal, and, like its living neighbour, breathes oxygen and emits carbonic acid. Hence this distinction of inhaling carbonic acid and exhaling oxygen on the part of the plant is only a functional one, and at best one of temporary nature. Depending on it alone, we should be compelled to call a buttercup or any other green vegetable a plant in the light, and an animal in the dark. Further, it is a distinction which does not hold good for the whole vegetable kingdom, and in this latter phase it must also regarded as unsatisfactory. All plants are not green, and such as want the green hue are therefore found to be incapable of utilizing carbonic acid. A mushroom, a toadstool, and others of their fungoid neighbours, have, in consequence of their lack of green colouring-matter, no partiality for carbonic acid. Habitually and normally, they are therefore animals in all essential particulars relating to their breathing; since they inhale oxygen and emit carbonic acid at all times, and whether in the darkness or in the light.

It is time, however, to call a halt in this process of scientific fault-finding, and to the task of showing how completely worthless most of the distinctions which the naturalists of bygone days drew between animals and plants, have been rendered by the progress of scientific research. Are all dis distinctions, then, of no avail in this task of separating one group from the other, and are we literally unable to say at the present time of some organisms, "This is an animal and that is a plant?" To these questions an affirmative answer must be returned. There are some lower forms of life—and the Monads are of them—which may either be one or the other. So hopeless have some biologists become of drawing distinctions between animals and plants, that they have proposed to construct what has well been termed "a kind of biological No Man's Land"—a territory belonging neither to the animal world nor to the plant world, but composed of uncertain living units, which are at home in neither kingdom. Such is the "Regnum Protisticum" of some writers. By most biologists, however, this arrangement has not been received with favour, for the construction and admission of this neutral territory or "refuge for the destitute," seems to amount to a tacit avowal of our absolute incapacity to separate out its members into their proper grades in the two kingdoms of living nature. —*In "Science for All."*

Agassiz.

On the 17th of June, 1885, Professor Burt G. Wilder delivered an address at Cornell University, at the unveiling of a tablet to the memory of Louis Agassiz. As many of our readers have not seen this paper, we quote a few of the more striking passages. He thus describes

AGASSIZ'S WORKING HABITS.

"His working habits were simple in the extreme. His private room was rarely occupied. The specimens and books he wished to examine were usually on a plain table in the common room, and in the few hours he could snatch from overwhelming administrative duties, he never seemed so happy as when, resting a foot upon the stool which at other times served him in the place of a chair, he held in one hand some Brazilian fish, and with the other turned the pages or plates from which to determine questions of identity, affinity, or distribution. While thus engaged he sometimes whistled very softly a little air the source of which I never ascertained."

To illustrate his constant alertness he gives the following

ANCEDOTE OF AGASSIZ.

"Thirty years ago the following is said to have occurred: A summer party of Harvard professors were driven through the White Mountains. As the coach slowly ascended a hill, Agassiz and others would leave it and presently return laden with stones and wild flowers, or ornamented with beetles and butterflies pinned to their hats and the lappels of their coats. Professor Felton sat in the coach perusing a favorite Greek author. "Who are those fellows" at last asked the coachman, in whose eyes plants were interesting merely as food for his animals, minerals as likely to impede progress, and insects as apt to interfere with personal comfort. "They are a party of naturalists" said Felton. "Ah!" replied he, "that accounts for it, poor fellows." A few days later he drove another party, to whom he confided his experience as follows: "Last Thursday I had the queerest lot of passengers you ever saw; they were men grown and dressed like gentlemen; but they kept jumping out of the coach, and like little children ran about the field chasing butterflies and bugs, which they stuck all over their clothes. Their keeper told me they was *naturals*; and judging by their conduct, I should say they *was*." Thus, the great naturalist was taken for a harmless lunatic; but he persisted and the people at last listened to his precepts and followed his example. And if to-

day, in almost any part of the United States, a man may pursue living creatures otherwise than for sport, and talk of them for another object than passing an idle hour, and nevertheless retain the respect of the community; if in short the occupations of natural history collecting and teaching are now honorable and at least more lucrative than before, it is to Agassiz more than any other man that the change must be ascribed."

Professor Wilder has this to say of

AGASSIZ'S FAITH.

"On the 8th of August, 1873, but a few months before his death, speaking of the recent loss of a valued assistant, Agassiz said: "My time will come soon, and I am ready." How many of us can say that with sincerity?

"His published writings, his private speech and his daily life gave assurance of his faith in a wise and tender Father, but he would not discuss dogmas, and repelled as an impertinence the too common American fashion of inquiring what church a man attends. Twenty-five years ago there was much less readily than now admitted to be a distinction between ecclesiastical observance and religious belief, so that, while criticised as a bigot by some scientists, Agassiz was attacked by some theologians as an infidel, because he could not reconcile the facts of geology with ordinary interpretation of the literal sense of Scripture. He did not deny that the Bible may be the Divine Word; he simply confessed his personal inaptitude for unraveling its mysteries; but he did feel that, without presumption and with some hope of success and usefulness, he might devote his life to the exposition of that other revelation of God to man, Nature."

A single incident illustrates

THE TENDER SIDE OF AGASSIZ'S NATURE

"Weighted from an early age with labors and cares which overtaxed even his great powers of body and mind, the tender side of Agassiz's nature was not seen by all. A single incident may show the readiness with which it could assert itself. For a certain piece of work an elderly German artist had come to Cambridge, leaving a large family in a western city. When his absence promised to be longer than at first anticipated, to relieve his loneliness, the old man sent for one of his children, a lad of ten. Supplied with credentials of various kinds, the boy reached Cambridge, and was directed to the house of "Herr Professor." It was after dark, and Agassiz sorely needed rest, after a long day at the museum. Yet—instead of sending a servant as some would have done—he did not hesitate to take the child by the hand, walk several squares, and deliver him to the anxious father.

In 1869, the great naturalist wrote to Professor Wilder, "Every year I am less inclined to work for money." This was in strict conformity with

AGASSIZ'S LIFE PURPOSE.

The following passage is quoted from an address delivered by Professor Agassiz on the centennial anniversary of Alexander von Humboldt, Sept. 14, 1869.

"The physical suffering of humanity, the wants of the poor, the craving of the hungry and naked, appeal to the sympathy of everyone who has a human heart. But there are necessities which only the destitute student knows; there is a hunger and thirst which only the highest charity can understand and relieve, and on this solemn occasion let me say, that every dollar given for higher education, in whatever department of knowledge, is likely to have a greater influence upon the future character of our nation than even the thousands and hundreds of thousands and millions which have already been spent and are daily spending to raise material ease and comfort."

To further these noble aims of Agassiz, to give wider extention to a knowledge of his work, and to stimulate the young to follow in his footsteps, is the chief aim and motive of the Agassiz Association. —*H. H. Ballard, Pres. of Agassiz Association.*

Cross Roads Meteorite.

Last September I purchased from Mr. B. E. Barnes of Boyett, N. C. (who secured it of the finder about three weeks after it fell), a small ærolite. It fell in the early morning about five o'clock, May 24th, 1892, in the township of Cross Roads, Wilson Co., N. C., and was seen by a young man named Gray Bass, who was only about two hundred feet distant. He seems to have been frightened by the sight and sound and waited two or three hours before going to the spot. With a stick he then dug up the meteorite, which penetrated 4 or 5 inches into the packed but sodded earth close by a road bed. Young Bass also states that some of the grass near the spot was dead and looked as if killed by fire! He further says that he thought the meteorite came from the northwest. From the testimony of others who heard it, however, it seems undoubtedly to have come from exactly the opposite direction, having been heard as far away as eighteen miles in a S. E. direction. Among those who heard it was a colored boy one quarter of a mile to the S. E., Mieajoh Hales, four to six miles to the S. E. who describes the noise as "somewhat like thunder accompanied by lesser sounds like the report of pistols or the snapping of burning reeds." Another man, Edward S. Dees, distant five or six miles nearly south, wrote in answer to my inquiries, that one clear morning before sunrise sometime in May he was in the open field and heard a peculiar noise which lasted a quarter of a minute and sounded like "a freight train crossing a trellis"—thought it came from the S. W. Wm. B. Scott, about eighteen miles to the S. E., writes that before sunrise on the 24th of May he and a neighbor heard a noise "something like a sky rocket but more like thunder which went off in a northern direction."

Mr. Barnes sent the stone first to the National Museum and a fragment weighing 4½ grams was broken off. With the exception of this piece nothing has been taken from it since it was picked up; several small chips however were broken off before it reached the ground and the broken surface partly crusted again. It now weighs 157 grams and it would probably have weighed about 200 grams, if it had reached the earth unbroken.

The thick even crust coating the meteorite indicates that it was a complete individual and not one of a shower. The freshly broken surface is of the usual gray color and the structure is chondritic. The dimensions of the stone are 1, 2 and 2½ inches. The specific gravity is 3.67, which is somewhat greater than most meteorites of this class, indicating a little more iron. EDWIN E. HOWELL.

PENIKESE—A Reminiscence.

By One of its Pupils.

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was the fortunate possessor of the only live one. It was found stranded upon the beach, one morning after a severe storm, in a nearly perished condition. How it survived the storm, the rocks and sand of the beach, and the amount of handling which it underwent in being transferred to a pail or fresh sea water, thence to my aquarium, I cannot well understand; yet it lived, and threw off a whole tank full of young, which went paddling around everywhere, of their own free will, "as happy as clams at high water."

This is only one of the many things which occupy our attention. Nearly every aquarium presents something of interest to study, and every moment of our time is fully occupied. Among the animals in some of the other aquariums are: both species of our common stickleback, the sea mullet, several kinds of periconikles, and both the large and the small hermit crabs, which, as they peer cautiously out of their shells, or travel rapidly about with their curious sidelong gait, resemble, somewhat, minute, full-grown lobsters—and amuse us all highly. There is some talk of setting up a small windmill, that the supply of water for our tanks may be regulated with some degree of certainty, as necessity requires that it should be. Our "finds" can then be all properly cared for, and fresh water constantly furnished for them, as is not now the case. Otherwise, we shall be obliged to continue bringing in the water in pails and letting it carefully into the tanks through rubber tubing, which is now provided for that purpose. Thus our general laboratory work, and plans for its furtherance, progress as well as one could possibly expect with the limited means at our command.

While the students study hard during the day time, they amuse themselves, in the evening, by strolling about the island, sitting upon the balconies and enjoying the delicious evening air and fresh, sea breezes, or rowing or sailing over the cool, restless waters round about the island. On Wednesday and Friday evenings Professor Meyer gives us delightful lectures upon *sound* and *hearing*,—illustrating his experiments with the excellent and costly instruments brought with him from the Stevens' Institute, Hoboken, New Jersey, from which place the genial professor himself hails. His lectures, though not compulsory, are attended by everybody, both old and young, and the lecturer is as great a favorite as what he tells us is interesting and instructive.

Occasionally we have lectures upon the lower forms of animal life, by a Professor Barnard—a rising young naturalist, who enters quite deeply into the subject. We have quite thorough descriptions of all the lower forms both of animals and vegetables,—but more especially the former: those whose structure is that of a simple, proto-plasmic mass, without any definite form, or without (at times, apparently,) even the little nucleus or life cell which is possessed by almost every animal in existence. Lectures upon these subjects are of the highest importance to those engaged in microscopic work and study. One is often completely at a loss how to make the best use of the material at one's command, without a thorough knowledge of just these very minute organisms; and what a field for microscopic investigation they unfold.

Among the rare captures, which have been made during the week, mostly from the contents of the "pounds," several of which are located in various places in the water not far from our island, and out of which fishes and other marine animals are brought to the school several times each week, are quite a rare species of the skate fish, a specimen of the thrasher shark, and several other species of fishes interesting, especially, for dissection. The students have already made abundant alcoholic dissections of the common ground shark—a small animal of the shark family, about three and a half or four feet in length, which is a very great nuisance to the fisherman; of the common skate; and of the flounder or "flat fish," as we were wont to call it when we were boys. In these the various organs and systems have been traced out, and are shown in a most perfect and beautiful manner. The work in this department is going forward under the direction of Professor Putnam.

A few of our students are particularly interested in the minute dissection and study of animals of the molluscous order. These are guided by Professor Morse, who is assisted by Mr. Brooks, who evidently knows nearly as much about the subject as the professor himself, and whose beautiful preparations are the wonder of all who behold them.

A number of large diagrams have been prepared, with great skill and labor, for the use especially of beginners, illustrating the complete anatomy, as finely as it can well be rendered on paper, of the leading animals in each group of the animal kingdom; these have been hung about the walls of the laboratories in the most artistic manner, and present quite an imposing effect as well as being very useful.

The latter part of this month Professor Packard is expected to arrive. He will give instruction in entomology and the crustacean and coorne families, and take charge of the dredging expeditions. Some very interesting farnes in these departments appear to be quite abundant in our locality,—both on the shores of the island and in the deeper waters farther off, where they are being constantly brought up by the dredge. As many of the farnes are microscopic, a most promising field will, without doubt, open to the investigators and investigatresses who shall enter therein.

Among the great days upon the island is *mail day*. This occurs whenever the steamer, or any other water conveyance, brings the mail bag: generally twice a week. One has but to say: *the mail has come!* and immediately everything is in commotion. Everybody stops work. No one can think of dissections, lectures, or drawings, at such a time. Professors and pupils, all, flock to the lecture-room, where the bag is opened and the letters and papers distributed. Newspapers are a much coveted article with us, though we none of us have any too much time to devote to them; and each paper goes the rounds of everyone on the island until it returns to its owner literally, as the school-boy said: "black, and white, and red," (read,) "all over."

Our work obliges us all to be early risers at Penikese, and I shall not soon forget the self-contented grin of delight with which Cuffy—our small, black, table-boy—armed with an immense tin horn, nearly or quite a foot in length, and such an one as would have delighted the heart of the most fastidious of college Sophomores, used to rush down the walk to the dormitories, and proceed to awaken the sleepers therein with the most resounding *toots* and heart-rending buzzing sounds that he could evoke, as a signal that breakfast would be ready in a*bout* half an

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

Come to Florida.

A fortune can be made in a few years in pineapples and tomatoes; vegetables raised the whole year. An ideal home. For particulars write **R. P. Osler,** Avon Park, Fla. 29&Otf

INSECTS.

Best books with fine illustrations on Insect Life published for the price.

Eberhart's Elements of Entomology, 40 full page plates, more than 300 figures, 45c postpaid.

Eberhart's Economic Entomology, finely illustrated, 35c postpaid.

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Knobel's Ferns and Evergreens of N. E., illustrated, 50c postpaid.

Knobel's Butterflies and Dusk Flyers, illustrated, 50c postpaid.

Knobel's Beetles of N. E., finely illustrated, 50c postpaid.

Mantou's Insects; How to Catch and Preserve, 50c postpaid.

Send 4c stamps for large illustrated catalogue.

CHAS. K. REED,
Taxidermist,
262 Main st., Worcester, Mass.

CUTS FOR NATURALISTS!
Large stock of Illustrations to select from. Send for sheet of specimens and prices of JOB PRINTING. Prices a little lower and work a little better than elsewhere. Write us what you want. **A. M. EDDY, ALBION, N.Y.**

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Catalogues of Birds Eggs, Shells, (both showy and scientific) Minerals, Relics, Curios, Bird and Mammal Skins, and Mounted Specimens and Supplies of all kinds for Entomologists, Oologists, Taxidermists, etc. Full stock of Glass Eyes always on hand. Send stamp and mention your specialty.

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to obtain a high-grade Opera or **FIELD GLASS** at a very low price.

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Send for circular No. 481 giving full descriptions and prices.

J. G. GRAY, Assignee for

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1010 Chestnut St., PHILADELPHIA.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,
Mfr of Rubber Stamps,
117 Clifton Street, Rochester, N. Y.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

The Mineral and Book Business of Dr. A. E. Foote will be carried on as heretofore under the management of Warren M. Foote.

AUGUSTA M. FOOTE,
WARREN M. FOOTE,
Executors for A. E. FOOTE, Deceased.

1226 North Forty-first St.,
Philadelphia Pa.

October 22, 1895.

Natural Science News.

ADVERTISING RATES.

Only 5c per norparell line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

100 lines	4½c	per line.
200 "	4	"
300 "	3½	"
500 "	3	"
1000 "	2½	"
2000 "	2	"

A column contains 120 lines; a page, 360.

A little two-line ad. would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

A small one inch ad. run one year would use 624 lines and would entitle the purchaser to the 3 cents' per line rate, and cost only 36 cents per issue.

A 3¼ inch ad. run one year would use 2,028 lines and would entitle the purchaser to the 2 cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

An Unique & Valuable Florida Package.

We are now putting up Florida Sea Shells and Curios in beautifully turned and polished **Hard Wood Boxes;** thereby saving to our customers freight or postage on a worthless case,

These boxes are hand turned from beautiful Florida woods, such as Orange, Lemon, Florida Mahogany, Cedar, Button Wood, Red and Black Mangrove, Palmetto, Spice Wood and many others.

At present we are making three sizes: A 50 cent size containing 25 fine shells and curios, with three first-class Florida photographs. A $1.00 size containing 50 fine shells and curios, with six first-class Florida photographs. A $2 00 size containing 120 fine shells and curios, with 12 first-class Florida photographs.

These packages are all hand-turned, with a beautiful finish and are an ornament to any cabinet. The above prices include freight or postage to your address.

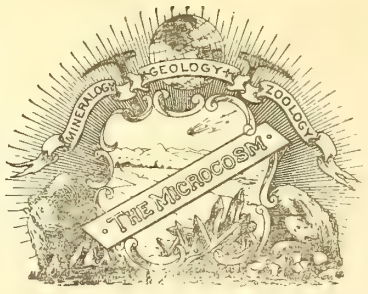
Many of our customers write us that they have been well pleased with the orders we have filled for them and that they always get two or three times as much for the money as elsewhere. We intend to sustain this reputation and shall always do as well or better than we advertise.

Address,

THE EBERSOLD FAMILY,

Oceanus, Brevard Co., Fla.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M. WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.



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FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

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Minerals, Rocks and Invertebrate Animals

t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

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THE BURROWS BROTHERS CO.,

Publishers, Booksellers, Stationers,

23, 25, 27 EUCLID AVE.

CLEVELAND, O., Sept. 21, 1895.

MR. F. H. LATTIN,

Albion, N. Y.

DEAR SIR:—

We ask your kind attention to an important book on Ornithology, probably the most important book for American collectors, "Audubon's Birds of America." The original folio edition complete, comprising four hundred and thirty-five plates magnificently colored from life, and each bird, life-size. Also the five volumes of descriptive text accompanying these plates.

We have just secured and are offering for sale an unique copy of this grand work. Unique in the following respects—that it is an absolutely uncut set throughout, just as issued from the author's own hands, plate by plate, the set having been carefully wrapped up just as issued and each plate is as fresh and clean as when issued by the author. Only one other set that we have been able to see or hear of, is claimed to be as uncut as this, and in this set the plates have been bound in full morocco, which must have somewhat damaged the part of each plate that is caught in the sewing of the binding. More interesting is the present set, as it is one of the two or three sets which the author finished with especial care by his own hands for presentation to his patrons and those who helped him in the publication of this work. There is only one other set now known to exist with the Turkey plate in the same state as the present, that in the Earl Spencer collection. In these two copies the Turkey plate has been heightened in gold, and extra colored as also are a few other plates extra finised in color.

The volume of the text of the present set bear autograph presentation inscription to David Eckley from Audubon.

Our price for this set is extremely low for so fine and perfect a copy, being $2,500.00. A much inferior copy, which was bound, and which was not a presentation set was recently sold in New York, for, we understand, $3,000.00.

If this set is of interest to you we shall be glad to hear from you at your early convenience.

Respectfully,

THE BURROWS BROTHERS COMPANY.

[*As the above letter is of no small amount of interest and thinking that some reader of the N.S. NEWS might be glad for an opportunity to purchase this extremely rare and valuable set of "Audubon's" we print the letter in its entirety.*—ED. NEWS.

NATURAL SCIENCE NEWS

VOL. I. No. 44. ALBION, N. Y., NOVEMBER 30, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All **copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.**

A FINE lot of sets and singles for sale cheap. Write at once for list. Address F.G.MEYERS, 3131 Mantua Ave., West Phila., Pa.

WANTED.—To exchange beetles for beetles named or unnamed, for butterflies and moths named. Those wishing to get up collections of beetles should address, D. B. YOUNG, Newport, N. Y.

FOR SALE.—9 vols. Smithsonian Reports, 1859, '62, '63, '64, '66, '69, '70, '71, '72; 280 New Brunswick 5c stamps (unused) and two coins Province of Nova Scotia, ½ d. Token 1832, all in good order. A. GORDON LEAVITT, Saint John, N. B.

WANTED.—A. O. U. Nos. 1, 7, 58, 80, 84, 118, 172, 204, 206, 300, 309, 310, 328, 332, 343, 349, 352, 360, 362, also many common species. Send full list and receive mine. Address, FRANK HARRIS, La Crescent, Houston Co., Minn.

FOR SALE. Complete set of the Natural History of New York; Botany, Zoology, Mineralogy, Geology, Palæontology, etc., with many hundreds of plain and colored plates. Low price. GEORGE P. HUMPHREY, Rochester, N. Y. 44-4t

FOR SALE OR EXCHANGE.—A collection of 140 different kinds of singles valued at $21 for $6.00 cash or for good breech loading shot gun. All eggs will bear identification. *Seven different kinds of hawks.* ROBERT J. HARDING, Chatham, N. Y.

WANTED to purchase eggs of 1896 collecting, full sets as follows: Loon, Tropic Birds, Hooded Merganser, all Cranes, all Kites, Sharp-shinned and Broad-wing Hawks, all Eagles, all Gyrfalcons, Duck Hawk, Pigeon Hawk, Rich. Merlin, Aplomado Falcon, Chuck-wills-widow, Whip-poor-will, Merrill's Parauque, etc. For above I will pay good cash prices. C. W. CRANDALL, Lock Box 3, Woodside, Queens Co., New York.

GEODES, fossils, minerals, beautiful cave specimens, buffalo horns (rough), sea curios for sale. Fossils and crinoid stems in limestone, petrified moss, (lb. pieces) for postage, if you'll return the cancelled stamps. CORA JEWELL, Shannondale, Ind.

WANTED.—Good cloth bound books, for which I will exchange fine fossils, minerals and eggs in sets. Send list. GEO.W. DIXON, Watertown, S. D.

TO EXCHANGE.—Himalayan rabbits for silver-grey rabbits and Peruvian guinea-pigs. Send stamp for catalogue of Himalayan, and Dutch rabbits, Abyssinian, and common guinea-pigs. Mention NATURAL SCIENCE NEWS. JOSEPH I. LAWRENCE, No. 123 West St., Worcester Mass.

A COLLECTION of 30 different arrow, spear lance heads and scrapers sent by mail to any address postpaid for 55c. These are from the famous Scioto Valley mound region. All fine. F. J. BROWN, Hayden Block, Columbus, O. O 44-4t

I HAVE a Kombi Camera to exchange for a good trained ferret. Express charges must be prepaid. ALBERT CESAL, No, 760 W. 18th St., Chicago, Ill.

WANTED.—A Gold Dollar in good condition, and a good pair of Opera or Field Glasses. Will give extra good exchange in fine fossils, minerals, shells, polished agates, Indian relics, books or mounted birds; or pay cash. GEO. W. DIXON, Watertown, So. Dak.

"AUKS" Wanted.—I will allow 30c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms Nos. 1 and 2 of NATURAL SCIENCE NEWS at 10c each and the following No's of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c: Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete, clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

"NOMENCLATURE of Colors for Naturalists," Ridgway. I want a good second hand copy at once. State cash or exchange price. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Those having fossils named correctly, with geological formation, and locality, to send list with lowest cash price. W. A. STEARNS, Atlanta University, Atlanta, Ga.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths. PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

FOR SALE or exchange, one gill net, 95 ft. long, 3 ft. wide, good condition, nearly new, $2; one good ferrit for sale or exchange. GEO. H. BOCKOVEN, Palmyra, N. Y,

STAMP EXCHANGE.—Collection of 750 Postage Stamps, mounted in Mekeel's best 1894 Album; want best offer of eggs in sets, with data, over $8. HARRY L. GRIFFITH, Santa Ana, Orange Co., Calif.

FOR SALE CHEAP:—18-drawer walnut coin cabinet. Curios exchanged for binding of magazines. EUG. SHUGART, Charlestown, care of Watson House, Jeff. Co., W. Va.

I HAVE a number of Government Reports that I would like to exchange for reports of other years or for good sets with data. H. G. HOSKIN, Tuttle, Colo. O

WANTED:—No. 5 Autoharp or good guitar. Have first class sets, banjo, novels, paper or coins to offer. W. A. STRONG, Tulare, Cal. 44-2t

1000 CIGARETTE cards to exchange for old coins, rare stamps, minerals and curios of any kind. For particulars apply to VICTOR NEAL, Gardiner, Me.

WANTED.—A new Winchester shot gun and rifle, high grade revolver and shot gun; will give rare sets, singles and skins. CLARENCE H. WATROUS, Chester, Conn.

FOR SALE.—My collection of eggs, nearly 400 varieties, including Golden, Bald, Gray, Sea, and Caracura Eagles, Spotted Owl, narly all the Hawks, and many very rare sets, value, $1000; will sell the collection or by the set, or will exchange for a place; write for list and prices. CLARENCE H. WATROUS, Chester, Conn.

Send 15c stamps and you will receive my new **Normal Catalogue** of all European-palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs**, including *Falco tinnunculus*, etc., etc.

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Emdener-Str. 4, Berlin, N. W., Germany.

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MINERALS,

Ancient Indian Relics, Stamps and Curiosities.
Price List, Postage Free.
W. Perry Arnold, Stonnington, Ct.

RARE SPECIES

Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

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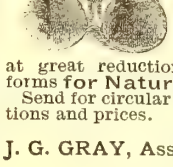

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1010 Chestnut St., PHILADELPHIA.

When answering advertisements always mention the NATURAL SCIENCE NEWS.

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40			6:00
Susp. Bridge .	6:45	8:10	11:25	1:48			6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55		6:45
Albion..... ....6:50	8:15		1:00	3:25	6:45		7:50
Rochester.....8:00	9:20		2:05	4:35			9:00

FLORIDA SHELLS

In reach of all. Cheaper than the cheapest. Now is the time to start a collection.

1. Strombus alatus, 2 to 3½ inches..... 4c
2. Fulgur perversus, 3 to 8 inch 6
3. Fasciolaria tulipa, 2 to 6 inch..... 8
4. " distans, 1 to 3 inches..... 4
5. " filamentosa, 1 to 3 inch..... 2
6. Cardium magnum, 3½ to 4 inches..... 6
7. " muricatum, 1½inch single valves 1
8. " serratium, 1 to 2½ inch... 3
9. Arca ponderosa, 2 to 3 inch..... 3
10. " noæ, 1 to 4 inch..... 3
11. " floridanum, 2 to 2½ inch..... 3
12. Cytherea (callista) gigantea, 3 to 5 inch...10
13. " " maculata, 1 to 2½ inch 6
14. Natica duplicata, 1 to 3 inch..... 2
15. Chama Arcinella, 1 to 2 inch..... 5
16. Dosinia discus, 2 to 4 inch..... 5
17. Pholas costatus, 3 to 6 inch, double valve...15
18. Murex pomum, 1 to 3 inch..... 3
19. " salleanus, 1 to 3 inch 5
20. Pyrula papyratia, 3 to 5 inch..... 8
21. Pecten exasperatus, ½ to 3 inch, single..... 1
22. Conus Floridanus, ¾ to 1 inch..... 2
23. " proteus, 1 to 3 inch..... 10
24. Pinna muricata, 4 to 10 inch 8
25. Lucina edentula, 1½ to 3 inch, single 2
26. Cancellaria carolinensis, 1 to 1½ inch..... 3
27. Oliva litterata, 1 to 2½..... 2
28. Anomia ephippium, 1 to 2½ inch..... 1
29. Melongena subcoronata, 2 to 6 inch 8
30. Cerithium eburnum, 1 to 1½ inch 3
31. Turritella, 1 to 1½ inch..... 2
32. Tellina, ½ inch..... 1
33. Marginella, ¼ inch..... 2
34. Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans 1
35. Sea beaver..... 15
36. Conch spawn ribbon, 18 inch to 2 feet.....20
37. Skate eggs..... 5
38. Rose coral, shaped like a rose 10
39. Florida air plants..... 10
40. Tarpon scales..... 2

$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

J. C. Baker successor to **Baker & Hanson**
Myers, Lee Co., Florida.

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

R-I-P-A-N-S

ONE GIVES RELIEF.

Just Received

A large and fine stock of Indian Relics and Birds Eggs which I am selling lower than ever before.

Postage extra.

Two-cent stamps taken in sums of less than $1.00.

25 per cent. discount on orders of $5.00 or over.

All goods strictly first-class with data.

STONE INDIAN RELICS.

Arrowheads from Pennsylvania, Ohio, New Jersey, New York, Massachusetts, Connecticut Indiana, Illinois, Kentucky, Oregon, California, Missouri, etc., various kinds, sizes and shapes, 3 to 5c each; per doz. assorted, 40c.

Spear Heads from above states, each...10 to 30c
Per doz. assorted.....$2.00
Axe Heads or Celts from above states, each .....15 to 50c
Per doz. assorted.....$3.50
Bird Points from Cal. and Oregon, each..... 3c
Per doz., assorted 30c
Sinkers from New York 8c
Pestles from Ohio, Ind., Ill., Penn., Conn. N. J. and Cal., each .....
Per doz. assorted .....
Wampum from Oregon and Cal., each ...5 to 10c
Per doz. assorted 95c
Whole Pottery from mounds of Missouri, each.....25c to $5.00
Whole Pottery fragments from mounds of Missouri, each.....5c
Per doz.....50

CENT. AMERICAN INDIAN RELICS.

Axe Heads of jade, stone, jasper etc., each, ...15 to 25c
Per doz $2.25
Spear Heads of jade, stone and jasper rare each 30c
Arrow Heads of jade, stone, jasper, rare each, 20c
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Diamond Cutting.

The diamond-cutting industry in Holland was formerly confined to a comparatively few Jewish families in Amsterdam, the traditions of the art being handed down from father to son for generations. Indian gems were cut up to about 1725, when the Brazilian diamond mines were discovered. The Dutch made a favorable treaty with Portugal, whereby almost the entire output of those mines came into their hands, and prosperity shone upon the diamond cutters.

In the beginning of the present century, however, diamonds became so scarce, through the primitive way of working the mines, and the increased demand, that all the diamond-cutting establishments, both in Amsterdam and Antwerp, came to a standstill, and the cutters had to adopt other occupations for a living. At that time the eminent banking firm of Hope & Company, London, arranged with the Portugese government to take all their rough diamonds at the fixed price of 45 francs ($9) per carat, while they sold the polished diamonds at 160 francs ($32). Fearing that through the depression and subsequent abandonment of all the diamond works, the art would be lost for Holland, and their monopoly would then be useless, Hope & Company selected seven young men whom they apprenticed at their expense with some old diamond polishers.

On the discovery of the Cape diamonds in 1869-70, a new era opened for the cutting trade. Quantities of rough diamonds came suddenly to London, but there were no work people to cut them, at least not enough there, nor in Amsterdam and Antwerp, even with reinforcements from the old hands who had long since abandoned the trade.

The South African diamonds were first discovered in the surface gravel, and were obtained at little expense, hence they could be sold cheaply, but as the public was yet under the spell of the old prices, a large margin of the profit was realized. This naturally caused many to leave other occupations and learn the diamond trade. Every one bought rough diamonds and was in haste to have them cut. To get ahead of the old merchants these new-fledged diamond merchants bribed the work people, and so a rate of compensation was established whereby the workmen received princely wages. In order to keep all these advantages, the work people formed a union, with the rules: First, not to work for less than the then ruling high pay; and second, not to take any new apprentices, not even their own sons, to learn any of the three different branches, of cleaving, cutting and polishing. For several years these rules were rigorously enforced. Still a few workmen held aloof from the union, and these made some apprentices at a premium of from 1,500 francs to 2,500 francs for a cleaver, and somewhat less for the two other branches of the trade.

After these fat years were passed, then arrived the lean years. Rough diamonds rose in price, owing to the large capital required to mine them. The speculation in polished diamonds fell off, the union could not be kept together, and wages gradually declined, so that ordinary work people now only make a living, though the best of them are still paid like artists, as some of them really are.

Twenty-five years ago the wholesale diamond merchants of Amsterdam did no exceed eight in number; but the development of the African mines so increased the trade that within the past decade several diamond exchanges or clubs have been established, as headquarters for the transaction of business. One of these, the "Handelsbond" has eighteen hundred members, and owns a fine building with rooms to facilitate the sale of the gems. Others, known as the "Adams," the "Golconda" and the "Koh-i-nur" are generally thronged with brokers and merchants, as are also the neighboring coffee houses. The male members of these clubs are called courtiers, and the female brokers courtesans. At present there are between fifty and sixty large diamond polishing establishments, employing some thirty-five hundred polishers, but no longer at the princely wages of from eighteen to two hundred dollars a week, which were paid when the African mines first began to produce so largely, and goods of the second and third quality brought much higher prices. Today they only receive fifteen to forty dollars a week, and some even less. There are ten thousand people engaged in diamond cutting in Holland.

Antwerp has been rapidly becoming one of the greatest diamond cutting centers. While in 1870 there were four mills and two hundred diamond workers, in 1893 there were seventy-eight mills and four thousand workers, and diamonds were annually cut to the value of twelve million francs. London comes third in importance; there the polishers, brokers, importers and dealears in rough diamonds must number about one thousand persons. St. Claude and adjouning cities in Jura mountains, in France, have several diamond cutting establishments, that employ in various capacities about one thousand people. Paris comes next with several diamond works; these will reach above five hundred individuals. Geneva and Berlin each possess a diamond cutting shop, at each of which perhaps one hundred people are employed; and, finally, Hanau, the jewelry center in Hesse, Germany, where much goldsmith's work is done, and where a few years ago were established two large diamond mills, and four or five small ones, all operated by steam power, which employed about five hundred persons.

At Idar and Oberstein about one thousand more are similarly engaged, giving a total of above sixteen thousand five hundred persons occupied in the diamond industry in Europe.

In 1887 the De Beers mining

combination was effected at Kimberly to regulate the output, and so prevent a fall in prices such as was feared under the competition then beginning to be felt among the mining companies. Since then, the annual output has been carefully calculated each year to meet the needs of the world, and prices have consequently remained firm.

Since the opening of the South African mines, forty-eight million carats of diamonds have been produced, valued at £60,000,000 in the rough, or more than £600,000,000 when cut. During the past twenty-five years a duty of 10 per cent. has been paid on about one hundred and seventy-five million dollars worth of cut diamonds imported into the United States.

After the diamonds have been collected in proper sized parcels at the mines by the various mining companies and licensed buyers they are shipped by mail steamers direct from the Cape to London, which, until two years ago, was the greatest market in the world for rough diamonds. These parcels were frequently sold within one or two days after their arrival in London. When the owners reside in South Africa, and the price expected is not realized, the parcels are sealed while the offers are cabled, and the transaction is often closed within twenty-four hours.

On the arrival of mail steamers, buyers from Amsterdam, Paris and Antwerp visit London to make purchases. The stones are then cut; exceptionally fine ones are sold separately, and the others in parcels according to size and quality.

A clever trick was resorted to during some negotiations in 1889 by Mr. Cecil Rhodes, the Napoleon of the diamoud world, and the organizer of the mining combinations. A fellow director, Barnato, made an offer for the entire stock on hand, which Rhodes agreed to, provided all should be weighed together, saying that he would like to see a bucketful of diamonds. They were all put into a pail, which they nearly filled, and as the market had no supply during the three months required to separate the stones again, according to grades, the price was sustained, and the company tided over the difficulty.

In January of the present year the Antwerp and Amsterdam dealers endeavored to break the English control of the rough diamond market by offering a higher figure than the English syndicate had bid for a three months' option on the entire output. The English syndicate then made a higher offer for the whole product of 1895, and a sale to them took place of $17,500,000, the limit fixed for the output this year.

One of the curious phases of the Amsterdam diamond cutting industry is the extent of the trade in diamond waste. Most of this material comes now from the cleavers. Formerly, when diamonds were still very expensive, cleavers did not deign to set to work upon a stone unless it was mainly of fair quality, and the most of it could be turned out as valuable diamonds. But now, through the competition in price, nothing may be rejected. If a piece of boart contains but one corner, though not more than one-eighth of a carat in weight when polished, it must be turned to account; and if this little available portion lies in the center of the stone it can only be reached by a great deal of cleaving, which will unavoidably produce many splinters and much dust. Cleaver's waste is of several kinds, generally sold in a lump to dealers. First, there is the boart, or the remnants of stones from which small corners have been taken off; these realize the full market price of boart. Out of the other waste are picked the few splinters yet fit to be worked into rose diamonds, next the long pointed splinters which, when inserted in a handle, are used for points in engraving upon stone, glass, etc. After these come the smaller bits, some of which may also be used for engraving, and the stronger ones for boring holes in porcelain, glass, etc. The smallest material of this kind is generally stamped into powder and employed in polishing diamonds, and in the arts. The coarser pieces, when smooth, are used for slabs, in which holes are drilled, and they are sold for wire-drawing, being much harder and more durable than any other substance for this purpose.

A great deal of waste also comes from the cutters. During the cutting a variety of splinters and fine fragments are thrown off, hence, the waste material furnished by cutters, and to some extent by the cleavers, is the sweepings, of which there are again two kinds, viz: First, "bak fulles," the residue of the bak or box upon which the friction of the two diamonds occurs, a mixture of minute diamond particles and scrapings of cement; second, "table fulles," or sweepings of the floor of the shop. All these pass through complicated processes of cleaning, by dexterous and experienced hands. At first nothing is seen but black dusty fragments of the cement used to fit the diamonds on the handles, with here and there a glimmering bit hardly visible to an inexperienced eye. The buyer, however, knows how to treat it by sifting, burning and boiling in nitric acid, so that out of this black mass is brought a fine snow-white powder, mixed with minute fragments of diamond used for stamping. An extensive trade is done in these different kinds of waste, and it is exported from Holland to various parts of Europe and America for technical purposes. Over two hundred persons in Amsterdam gain their living as dealers in diamond waste and sweepings.

The subject of diamond cutting in the United States is worthy of consideration. Since 1868 more than one hundred and seventy-five million dollars worth of diamonds have been imported into the United States, of which about fifteen million dollars worth came in the eleven years between June, 1882 and June, 1893. Of these the original rough stones could not have cost more than one-half. If these stones had been cut in this country it would have given employment to five thousand men for the past twelve years at the average yearly wages of $1,000. The difficulty in establishing the diamond cutting industry in this country is the inability of dealers to obtain rough stones at first hand, and the fact that diamond cutting is an established industry, and in many ways waste is prevented by a more economic system of working.

In the years of 1882 to 1885 a number of American jewelers opened diamond cutting establishments, but the cutting has not been profitably carried on in this country on a scale large enough to justify branch houses in London, the great market for rough diamonds, where advantages can be taken of every fluctuation in the market and large parcels purchased which can be cut immediately and converted into cash, for nothing is bought and sold on a closer margin than rough diamonds.

During 1893 diamond cutting was carried on in the UnitedStates by fifteen firms, each employing from one to twenty men, the total number amounting to from one

hundred and thirty to one hundred and fifty cleavers, cutters, polishers, etc.

Mr. Henry D. Morse, of Boston, was the pioneer diamond cutter of the United States. He can justly be called the diamond cutter par excellence, and the best cutters in the United States today received their trainiug under him. But educating young Americans, both men and women, to his art, was not his greatest work. He showed the world that the art which had so long been a monoply of the Hollanders, was degenerating in their hands into a mere mechanical trade. His treatment of the diamond gave great stimulus to the industry both in the United States and abroad. Shops were opened here and in London in consequence of his success. He was one of the few who studied the diamond scientifically and taught his pupils that mathematical precision in cutting greatly enhances the value as well as the beauty of the gem. His artistic eye, sound judgment and keen perception enabled him to carry the art to a perfection seldom, if ever, attained before. In his shop a machine for cutting diamonds was invented which did away, in a great measure, with the tediousness and inaccuracy of the old manual process. Thanks to his labors, we now have among us some of the best cutters in the world, men who treat the diamond as it should be treated to develop its greatest beauty. The fact that so many fine stones were recut here after he started his wheel led to a great improvement in cutting abroad, especially in the French Jura and Switzerland, where both men and women are now employed at the trade, and, as a result, the diamonds sold today are decidedly better cut than those of twenty-five years ago, before Mr. Morse turned his attention to the work that showed to all the world that diamond cutting is properly an art, and not an industry.—*Atlanta Constitution.*

The Mt. Joy Meteorite.

The Mt. Joy Meteorite is the third largest found in the United States, and the largest east of the Mississippi River.

It was found in November, 1887, on or about the 16th of the month, by Jacob Snyder, about a foot below the surface while digging to plant an apple tree near his house, five miles to the southeast of Gettysburg, in the township of Mt. Joy, Adams Co., Penn. It was supposed by the finder and his friends to indicate the near presence of an iron mine, and considerable prospecting was done to locate it. The meteorite was placed on some timbers in the open air where it remained until the summer of 1891, before it was seen by any one who surmised its true character.

Professor F. W. Clarke induced Mr. Snyder to send it to the National Museum for inspection, but was finally unable to secure it, as Mr. Snyder was unwilling to part with it for a price which the Museum felt justified in paying. I. therefore purchased it from Mr. Snyder on the 15th of August, 1891. The three largest dimensions of the meteorite are 11, 24 and 33½ inches and it weighed on the museum scales 847 lbs. Professor Clarke had a few ounces taken off for examination; with this exception and the scaling of decomposed crust, from the outside, the mass still remains as it was found.

Professor Clarke has kindly furnished me with the following analysis, made by Mr. L. G. Eakins in the laboratory of the United States Geological Survey.

Professor Clarke did not succeed in developing the Widmanstattian figures satisfactorily, and the small amount of nickel shown by the analysis would indicate a poor etching iron; when larger surfaces are available, we shall doubtless obtain better results.

Fe	93·80
Ni	4·81
Co	0·51
Cu	0·005
P	0·19
S	0·01
	99·325

No idea can be formed of the length of time the meteorite had lain in the ground and very little of the amount of surface decomposition, it has undergone;—sufficient, however, to remove all the finer pittings, leaving a comparatively smooth surface.

Having been much interested in Mr. Davison's examination of the the magnetic properties of the Welland meteorite, and thinking that this line of investigation in other meteorites, might lead to interesting results, I requested Mr. Marcus Baker of the U. S. Geological Survey, to make an examination of the meteorite, which he kindly consented to do.

The result of this examination is to show that the meteorite, as a whole, acts as a mass of soft iron, gaining polarity under the inductive action of the earth. The lower portion on the north side became a north-seeking pole; while the upper part became a south-seeking pole; a pretty distinct neutral line was shown, inclined to the horizon at an angle (20°-25°) which is approximately the complement of the local inclination of the dipping needle. This induced polarity shifted with each change in the position of the whole mass, and in general this shifting or the poles took place promptly though not always at once. Mr. Baker also states that his observations suggested the probable existence of an unequal distribution of permanent magnetism, but this matter requires further investigation. --*E. E. Howell in American Journal of Science.*

How to Examine Objects with the Microscope.

Many amateurs defeat their own purposes by attempting to examine too much of a substance at one time. Thin sections and small portions of objects to be examined should be placed under the microscope. The microscope, as the name implies, is an instrument for the examination of small things. Generally a very small particle of the substance to be viewed will answer far better than a large amount! A particle as big as a pin's head is usually sufficient. In examing blood such a quantity is a plenty; but a drop as big as indicated is too large until it is spread out. Place the drop to the left of the center of a glass slip; take another slip with a true edge; with the latter press firmly and draw to the right so that but a thin film is left on the first slip of glass, cover immediately with a thin glass and examine with a fifth or quarter objective and the corpuscles will be nicely displayed. In the case of starch or spicules use but a small drop and examine under a cover and much more will be seen and made more beautiful than if a large or thick mass were attempted to be examined.

So with butter, a drop as above mentioned placed on a slide, covered and pressed with the finger into a film, will under a quarter objective instantly show the natural crystals. The rule here stated is a good one to become accustomed to and experience will demonstrate that too little will be more satisfactory than too much.—*The Microscope.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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hour. Well did he perform this his most delightful duty! He would usually continue the exercise until the most obdurate lover of Somnus had become fully aroused. The flourishes and grimaces with which all this was accompanied and executed would have caused many a hearty laugh, could you have seen him, as you were awakened, in spite of your desire to remain longer in delicious repose, by the perseverance of the good-natured urchin, who reminded one greatly of a small, insignificant, but very troublesome fly, who returns again and again, as often as you drive him away, to torment you.

Our dormitories, this year, are much more convenient, in every way, than they were the year previous. Now there are plenty of rooms; and each person is thus provided with a separate and individual apartment. These two buildings, which are dormitories above and laboratories beneath, are crossed in the center by a lecture-room, and look, from without and at a little distance, like an immense letter H. The laboratory doors face the sea—at least two of them, at the rear of each room—and give us plenty of fresh air, as well as a fine view of the harbor and of the surrounding waters. In these rooms we are busy by day and by night. I recall one of our number who labored both diligently and often at the Echini. These "Sand-dollars," as they are vulgarly called, engrossed his especial attention. The seamen call them "Spanish dollars," owing, no doubt, to the fact that they come from the bottom of the sea and call to mind, perhaps, the old legends of hidden treasures restored to rash adventurers by some similar, seemingly mysterious process as that by which now we dredge old ocean's bottom, and brought to light its valuable products.

During our second week upon the island, which has just closed, we have had another delightful evening lecture on *sound*, by Professor Mayer; his agreeable manners and perfect experiments making it doubly interesting. Mr. Barnard, also, has given several additional talks upon the protazoa or lower animals; but, although the speaker tried his utmost to illustrate the difference between these lowest forms, I sadly fear that, to many, the *amœba* and *protamœba* and *amixa* and *protamixa*, were so confounded in the minds of the listeners, owing, no doubt, to the slight real difference between them, that few were benefited thereby. But Mr. Roetter, the genial, patient Mr. Roetter, has shown more and more of the calm endurance required to complete a finished, satisfactory sketch of some object of special interest. How slowly, methodically, and yet how well he drew and instructed; his own drawings were our object lessons, often,—and well we knew that we could never attain to such a degree of artistic beauty and excellence. It was thus that each professor, in his department, sought to give us his *best* from which to form a model for us for our future scientific advancement and career.

Sunday! It is a very quiet day with us: no work,—but complete rest. We have church, or rather a sort of social meeting or gathering together in the morning, and are left free to wander where we will for the remainder of the day, which closes with a *singing service*—if so we may call it—from the little fort on the hill, in the evening, and from which it is accounted quite a disgrace to be absent. In the singing all who can and wish join.

After considerable urging, our colored waiters form a chorus of their own and treat us to some of their native songs. Far over the waters float these simple words of praise. Everyone who has ever heard them is aware of the wonderfully peculiar pathos that there is in the melody of songs sung by good colored singers. There were four in our chorus, and their voices harmonized well together. We retired from the little fort, during the singing, and the minstrels occupied it alone. They sang with great power, pronouncing each word clearly and distinctly. Their songs were simple, both in word and in tune, but they seemed to us, upon that wave-lapped island, so far from land, as coming from creatures more angelic than human—more divine than the civilized relics of a barbaric race. We remained near and listened—some standing, others reclining upon the grass near by: And so the twilight passed into evening shades, and they into the darkness of the night, and it was late before we retired.

Today, Monday, Professor Wilder gave us a lecture upon Professor Agassiz. He told us that the latter had told him, some time previous to his death, that he feared that he might pass away at any moment, and that he believed that his days on earth were numbered; that he might die, "in a year, a month, a week, a day, or even an hour," adding, simply, "and I am prepared." Such were Mr. Agassiz's own convictions. We too, believe, with another, that Professor Agassiz's death is "one of the deepest calamities that has fallen upon the thinking world."

On Tuesday evening the old Agassiz Natural History Club was again organized, with a president, two vice-presidents, a secretary and treasurer combined in the same office, and an executive committee of five members. The meeting was opened by a few remarks, appropriate to the occasion, by the president, and then given up to the discussion of scientific subjects, which pleasantly occupied the remainder of the evening. Remarks were made on the movements of the eyes of fishes while swimming in different positions in the water. Two of our professors, who were present, explained: The one, the nerves and movements of the fish eye in general; the other, the general structure of the eye and the apparent reason for the peculiar movements previously alluded to. The question was, as to whether the pupil moved in a line with the inclination of the body or not; the opinion, pretty generally expressed, seemed in favor of the affirmative. Remarks were also made upon the difference in the development of the tadpole, or young, of our different species of toads and frogs. In showing the periods of growth in the different species, the speaker said: that in batrachians the hind feet were those which were first developed, while in the salamanders it was the fore feet; thus distinguishing the young of these two great classes. He said that all our species of the former, excepting those of the green and spotted frogs, assume their true form very soon after hatching from the egg, while those refered to were sometimes two to three years in maturing. He showed, also, that physical conditions have much to do with the quickness with which they assume their adult forms, and that they must be able, for their proper and perfect development, to leave the water at times, and climb up upon the mud or earth banks of their breeding-pool, where, thus keeping their bodies still moist and hence supple, they could, at the same time, exercise their limbs and receive the sun upon them. And thus, after many other inter-

(*To be continued.*)

PUBLISHERS'S DEPARTM'T

Going West.

The advice given by Horace Greeley so many years ago, to go west, is being followed every day by an increasingly large number of men and women. Some go to stay, to build new homes, others for pleasure, still others go to look after great business interests, but they go, and they one and all wish to go by a route which combines safety, speed and convenience in traveling. This is the reason why so many choose the Nickel Plate Road. From Buffalo to Chicago its line lies almost as straight as an arrow, and intersected at such frequent intervals by connecting roads that the map looks as if the road should be named "Through line to everywhere." More than thirty connections are given, reaching out in every direction. Then too, many travelers demand a certain amount of luxury when traveling, and Wagner cars between New York, Boston, Buffalo, and Chicago. The uniformed colored porters in charge of day coaches, and the unsurpassed dining car service, supply this. Accommodations may be secured in advance by addressing Mr. F. J. Moore, 23 Exchange St., Buffalo, N. Y. He can give details as to rates, connections, and all necessary arrangements, both east and west of Chicago.—*From Elmira Journal.*

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I have lately bought of the Scott Stamp & Coin Co., of New York, their entire stock of Confederate and Broken Bank Bills, Bonds, etc., consisting of over 40,000 pieces ranging from 5 cents to $1,000. This added to my stock, which was large, gives me one of the largest, if not the largest stock of paper money in the world. These interesting relics of the Rebellion and "Wildcat" days I am now ready to offer to collectors and dealers at low prices. All guaranteed genuine originals. Any of the following lots sent postpaid on receipt of prices quoted. Eight varieties of Confederate bills, 1861 issue, $1.00. The same cancelled, only 40cts. Two rare 1861 bills catalogue value, $2.00, only $1.30. The same, but cancelled, only 40 cts. Complete set of 1864 notes from 50 cts. to $5.00; nine varieties, 75 cts; 25 varieties from 50 cts. to $100. including 1861-2 3-4 issues—a nice collection only $1.20. Two bills of 1864, a $5.00 and $10.00 bill only 10 cts. Three bills, $5.00 and $10.00 1864, and $100 of 1862, only 15 cts. Four Confederate State bills (issues of different states), only 10 cts. Ten varieties of same only 25 cts. 25 varieties from 5 cts. to $20, only $1.00. A mixed lot of 100 for a dealer only $2 00. Six varieties of Broken Bank Bills, all issued before 1860, only 25 cts. 10 varieties only 40 cts. Mixed lot of 100 for a dealer only $3.00. These can be sold for $10.

A Grand Collection of 100 varieties, including Confederate, State Issues, Broken Banks, etc., sent by Registered Mail for only $5.30.

A $1,000 Confederate bond with coupons only $1.00. A $500 bond 75 cts. A $100, 50 cts. The three varieties only $2.00. Remember I have a great many varieties in stock rare or common. This is but a partial list. On receipt of from $1.00 to $5.00 deposit I will send selections on approval.

To the first 10 persons sending me $5.00 for bills or bonds on this list, I will send a $1,000 bond free. Don't fail to send. This will not appear again. Send money orders or registered letters.

A large stock of Postage Stamps, Indian Relics, etc., wholesale or retail. Satisfaction guaranteed. Established over 15 years. Agents wanted.

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Address, J. E. HANDSHAW,
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Natural Science News.

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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

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All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

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White Chalcedony Geodes, Sherry colored Barite, Golden Calcites, Needle Tourmaline, Deep Rose Quartz, Petrified Knots of Black Wood, Tin Ore, Griphite, (new and only here) etc. Four tons of Crystals, Ores, etc.

Send $1, $2 or $5 and see what a fine "layout" you will get postpaid.

Bad Land Fossils. 10,000 Arrow Heads from all over the United States. Sioux, Alaska, etc., Indian Relics and Photos. Large priced Catalogue for stamp. A series of 7 Geodes, all different, by mail for $1.75. Unequalled in the whole world.

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First-class Bird Skins.

Rare Reptiles in Alcohol.

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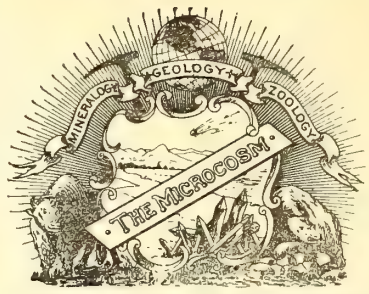

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To Collectors.

At any time between Thanksgiving and New Years I will fill orders for anything on

Lattin's "June Bulletin"

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If you have mislaid your copy of Bulletin, write for one at once.

Faithfully,

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A Christmas Present.

My process of mounting and preserving birds, game pieces, deer heads, plaques, etc., with full instructions for work, together with one pound of preserving compound, enough for mounting 40 or 50 small birds, or twenty birds the size of a Quail, only

50 CENTS!

Over 400 orders in '95. Over 700 pounds of compound sold in '95.

A first-class Christmas Present and acceptable to all. The holiday season is the best time in the year for amateur taxidermists to practice.

N. B.—This offer holds good, at this figure, only until December 31, 1895.

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Clearance Sale.

26 Pages Written Quotations.

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Over 100,000 Specimens at prices that will surprise you.

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NATURAL SCIENCE NEWS

VOL. I. No. 45. ALBION, N. Y., DECEMBER 7, 1895. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

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A COLLECTION of 30 different arrow, spear lance heads and scrapers sent by mail to any address postpaid for 55c. These are from the famous Scioto Valley mound region. All fine. F. J. BROWN, Hayden Block, Columbus, O. O 44-4t

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WILL EXCHANGE:—A set of Flicker's and Red-wing Blackbird's eggs and the books "Oliver Twist" and "Twice Told Tales" for eggs or Natural History books. KIRKE RYDER. Worcester, N. Y.

FOR SALE:—A fine collection of Pennsylvania mounted birds (including one Golden Eagle) at reasonable prices. Will also exchange for other specimens. Complete description for stamp. MISS LEAH BERKHEIMER, Osterburg, Bedford Co., Penna.

WILL GIVE 35c. each for following No's of the Auk in good condition—Vol. I. No. 3, 4; Vol. II, No. 1, 2, 3, 4. CHAS. E. INGALLS, East Templeton, Mass.

WANTED:—At all times, fine sets for which I offer fine fossils, Indian relics, polished agates, books and mounted birds. GEO. W. DIXON, Watertown, So. Dak. O45-3t

WILL EXCHANGE OPALS, rough or polished, for any natural science specimens, shot gun, camera, typewriter, patented novelties, old gold, natural science books, small printing press, duplicator, any tools or useful article, advertising space, etc. ROBERT BURNHAM, Dennis, Mass.

"AUKS" Wanted.—I will allow 30c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms Nos. 1 and 2 of NATURAL SCIENCE NEWS at 10c each and the following No's of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete, clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

"NOMENCLATURE of Colors for Naturalists," Ridgway. I want a good second hand copy at once. State cash or exchange price. FRANK H. LATTIN, Albion, N. Y.

WANTED.—Those having fossils named correctly, with geological formation, and locality, to send list with lowest cash price. W. A. STEARNS, Atlanta University, Atlanta, Ga.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths. PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

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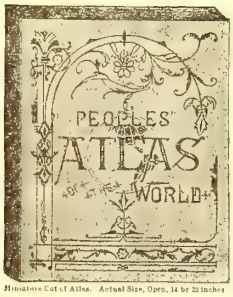

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:50	
Niagara Falls.	6:35	8:05	11:18	1:40		6:00	
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05	
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45	
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50	
Rochester.....8:00	9:20		2:05	4:35		9:00	

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4.	" distans, 1 to 3 inches	4
5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ, 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch. single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon, 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

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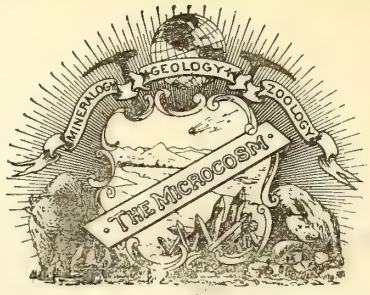

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TO NEW PARTIES:—Send 10 cents for our complete catalogue of Supplies, Eggs, etc., etc.

FRANK BLAKE WEBSTER CO.,

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Natural Science News.

VOL. I ALBION, N. Y., DECEMBER 7, 1895. No. 45

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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The Petrified Forest of Arizona.

Rich as is the far west of our country in natural wonders, it possesses nothing more remarkable in its way than the strange freak of nature popularly called "the petrified forest," found in Apache counto, Arizona. This name is applied to a marvelous deposit of silicified remains of what was once a vast forest, which may now be traced by its fossilized relics over an area of a thousand acres. The primeeval forest itself, of which these stony remains formed a part, of course, was far more extensive, covering according to one estimate, "hundreds of square miles;" but the causes which acted to cast down, bury and mineralize those which have been well preserved, exerted their influence apparently on only the limited area where they are found. The existence of this extensive deposit of silicified trees in all stages of preservation, from complete trunks a hundred or more feet in length, to innumerable sections of all sizes, was first made known some twenty years ago by the accidental find of a miner who was prospecting in that region. Since the publication in the scientific journals and popular magazines of accounts of its wonderful character, the deposits have attracted great numbers of visitors, being situated along the line of the Santa Fe railway, from which the tourist may readily make the journey and return to the railway station on the same day.

The manner of the occurrence of the silicified deposit is said to be absolutely bewildering. Dr. H. C. Hovey, a capable scientific observer and most entertaining writer, who has written much the best popular account of the deposit, gave the following graphic description of the impression the scene made upon him, in a lecture recently delivered before the Franklin Institute:

"How shall the Chalcedony Park be described? At first one gets the impression that it is a small affair, of perhaps fifty acres. Then he says that it must be a hundred. And after riding over its amazing ruins for many hours in succession he concludes that the area includes a thousand acres; and finally he hardly questions the bold estimate of C. F. Loomis, that the extensive forest now hardened into stone formerly covered 'hundreds of square miles,' and accepts without dissent the assertion of G. F. Kunz, that there may here be seen at a glance a million tons of precious stones. A matter of fact visitor might say that the scene reminded him of a vast logging camp, where the lumbermen had tossed the huge logs from their sleds at random, and then had gone away, leaving them to become rain-soaked and moss-grown. The trees, when standing, were fully 200 feet high, for even now their prostrate trunks measure, when unbroken, from 100 to 150 feet. The peculiarity already hinted at is that these mighty trunks are as regularly severed into sections as if the work had been done by a cross-cut saw. The lengths vary from disks like cart wheels to logs twenty or thirty feet long or longer. Twigs are found an inch through, and trunks ten feet thick. They lie at every angle, parallel to each other, and at right angles; singly and in great groups; down in gulleys, and perched like cannon on hill-tops.

"And all these myriad of trunks, stumps, logs, branches and tiny twigs are solid stone. And on inspection they prove to be precious gems of almost every known variety. Those that remain intact have been weathered to a dark red, rich brown or a sober black. But time's relentless axe, aided by the geologist's hammer, has made havoc with so many of them that the ground is thickly strewn with their fragments from rocks like bowlders down to chips and minute splinters, that show their brilliant colors under the fierce Arizona sun with kaleidoscopic effect. At every footfall you tread on gems, some of which might grace a ducal coronet, while the most plain and least attractive would be worthy of an honored place in the finest cabinet. There are no rubies, sapphires nor diamonds here (as has been incorrectly reported), but the amethyst abounds, and the red and yellow jasper, chalcedony of every hue, the topaz, the onyx, the carnelian, and every imaginable variety of agate. No log, nor fragment is limited to a single kind of gem. Many are massive mosaics of all the kinds named above. The material breaks pretty easily into cubical forms, but it is extremely hard, and takes a brilliant and durable polish.

"Under a magnifying glass the cellular structure is plainly visible, and experts state that the ancient forest was made up of trees analogous to our pines and cedars. The region is decidedly volcanic, lava beds and extinct craters being in sight in every direction. Some catastrophe doubtless felled the 'forest primeval,' which was subsequently buried in volcanic action. Floods of hot silicious waters were poured over the ashes, possibly from geysers. The pure silica, as Mr. Kunz suggests, would form the limpid quartz, while the rich colors of red, brown, yellow and purple would be due to iron and maganese held in solution. I found one block of wood that had changed to solid iron.

"Spurring my horse from the valley to the summit of the mesa, mainly formed of light gray sandstone, I followed a trail to its further side, where it is cut by a small canon about fifty feet deep. And here is the Agrte Bridge, the most wonderful object of its kind in existence. This unique bridge is simply a huge trunk spanning the canon where it is sixty feet wide. The trunk itself is a hundred feet long, and tapers down from a thickness of five feet to diameter of three feet. Its entire mass is made up of agates, jaspers and other precious materials. At a point two-thirds of the way across it is fractured, whether naturally or by violence I could not determine. At the bottom of the canon is a pool resorted to by the cattle

of the plains and around it grow the only living trees to be seen for miles."

This charming pen-picture will give the reader a vivid and truthful impression of this wonderful deposit which excites the unbounded enthusiasm of every intelligent visitor.

The late World's Fair at Chicago for the first time afforded the public an adequate idea of the beauty and diversity of this fossilized wood. In the Arizona Building, and more extensively in the Manufacturers' Building, were remarkable exhibits of the material. In the Manufacturers' Building, the Drake Company, of St. Paul, Minn., made a superb display of the material sawn into slabs and polished, to form table tops and other pieces of furniture. The beauty of these polished agate surfaces cannot be adequately described, and they naturally attracted the admiring attention of thousands.

The Drake Company, which has made a special business of preparing the silicified wood for decorative purposes, has erected costly machinery for sawing, shaping and polishing the material at Sioux Falls in South Dakote. There is nothing in the whole range of nature's mineral productions that exceeds these superb specimens in beauty, if, indeed, there is anything capable of being adapted for similar purposes that can compare with it. Extensive as the deposit is, it contains comparatively little material sufficiently perfect to be adapted for the production of large and flawless slabs, and the comparatively limited supply, to which should be added the cost of working the material on account of its extreme hardness, must always render it a costly luxury, but one which must enhance in value with years from its growing rarity, its practical indestructibility and surpassing beauty.—*In The Manufacturer and Builder.*

Earthworms.

BY C. F. MARSHALL, M. D., B. SC., F. R. C. S.

The common earthworm, despised by man and heedlessly trodden under foot, fulfills a part in nature that would seem incredible but for the facts revealed by the patient and long-continued researches of Darwin. "Worms," says Darwin, "have played a more important part in the history of the world than most persons would at first suppose." Let us follow Darwin, and see how this apparently insignificant creature has changed the face of nature. We will first consider the habits and mode of life of the earthworm. As every one knows, the worms live in burrows in the superficial layer of the ground. They can live anywhere in a layer of earth, provided it retains moisture, dry air being fatal to them. They can on the other hand, exist submerged in water for several months. They live chiefly in the superficial mould less than a foot below the surface, but in long-continued dry weather and in very cold seasons they may burrow to a depth of eight feet. The burrows are lined by a thin layer of earth, voided by the worms, and end in small chambers in which they can turn round.

The burrows are formed partly by pushing away the earth, but chiefly by the earth being swallowed. Large quantities of earth are swallowed by the worms for the sake of the decomposing vegetable matter contained in it, on which they feed. The earth thus swallowed is voided in spiral heaps, forming the worm castings. In this case the worm obtains food and at the same time excavates its burrows.

In addition to the food thus obtained, half decayed leaves are dragged into the burrows, mainly for food, but also to plug the mouths of the burrows for the sake of protection. Worms are also fond of meat, especially fat; they will also eat the dead bodies of their relatives. They are nocturnal in habit remaining, as a rule, in the burrows during the day and coming out to feed at night.

The leaves dragged into the burrows are moistioned by a fluid secreted by the worm, of a digestive nature, and the food is thus partly digested before being swallowed. The digestive fluid of the earthworm resembles the pancreatic juice of higher animals, and only acts when alkaline. Various acids are produced by decaying vegetable matter, and similar changes occur in the leaves swallowed by worms. Now if some of this acid was not neutralized, digestion could not take place, because the digestive fluid is alkaline. This is avoided by the action of some small glands, called the calciferous glands, opening into the alimentary canal. These glands secrete carbonate of lime, which neutralizes the acids generated in the decaying leaves.

The earth worm has no eyes, but is affected by strong light, if exposed to it for some time. It has no sense of hearing, but is sensitive to the vibrations of sound. The whole body is sensitive to touch. There appears to be some sense of smell, but this is limited to certain articles of food, which are discovered by the worm when buried in earth, in preference to other bodies not relished. The worm appears to have some degree of intelligence from the way in which it draws the leaves into its burrows, always judging which is the best end to draw them in by. This is remarkable in so lowly organized an animal, being a degree of intelligence not possessed by many animals of complex organization. For instance, the ant can often be seen dragging objects along transversely, instead of taking them the easiest way.

As we have seen vast quantities of earth are continually being passed through the bodies of worms and voided on the surface as cast ings. When it is stated that the number of worms in an acre of ordinary land suitable for them to live in is fifty-three thousand, we can imagine the great effect which they must have on the soil. They are, in fact, continually plowing the land. At one part of the alimentary canal of the worm is a gizzard, or hard muscular organ, capable of grinding food into particles; it is this gizzard which is the main factor in triturating the soil, and it is aided by small stones swallowed with the earth, which act as mill stones.

The earth is thus continually passing through the mill formed by the gizzards of worms, and is reduced to fine mould. Again, from the collapsing of the old burrows the mould is in constant slow movement and its particles rubbed together. Fresh surfaces are thus exposed to the action of the carbonic acid in the soil and to the humus acids, agents which act in the destruction of stones and rocks. Moreover, the acids produced in the digestive tract of the worms are not all neutralized, for the castings have an acid reaction, and this acid acts further in the disintegration of rocks.

Thus all the mould covering a field passes every few hours through the bodies of worms, and the fragments are probably swallowed and brought to the surface many times over in the course of centuries. Changes are also produced in the slopes of hills by the flowing down

of moist castings and the rolling down of dry ones, thus reducing the slope of the hills by accumulations at the bottom. The castings are also blown repeatedly in one direction by the prevalent winds. Now as a layer of earth one-fifth of an inch thick, or ten tons by weight, has been calculated in many places to be brought annually to the surface per acre, if only a small part of this flows down every inclined surface, or is blown by the wind repeatedly in one direction, it is easy to see that a great change may be produced in the surface of the land in the course of ages.

In consequence of the immense amount of earth continually being brought to the surface by worms, it is not difficult to understand how objects, such as stones, rocks, etc., lying on the surface will in course of time become gradually buried in the ground. The worms, undermining the stones, bring up the earth to the surface, and so raise the ground round the edge of the stone till the latter sinks and is eventually buried in the soil, provided the soil is suitable for worms to live in. Darwin showed that in a field covered with flints of various sizes, the smaller ones disappeared in a few years, and in thirty years all had become buried, owing to the action of worms.

Owing to the burial of stones and other objects by the action of worms, ancient monuments, portions of Roman villas and other objects of antiquity have been preserved. These have been gradually buried by the worms, and so preserved from the destructive effect of rain and wind. Many Roman remains were studied by Dar win, and traces of the action of worms found, to which action their preservation was mainly due. The sinking of the foundations of many old buildings is due to the action of worms, and no building is safe from this unless the foundations are laid lower than the level at which the worms can work, viz., about eight feet below the surface.

Another useful effect produced by worms is the preparation of the soil for the growth of seedlings. By their agency the soil is periodically sifted and exposed to the air, and in this way is able to retain moisture and absorb soluable substances of use for the nutrition of plants.

Moreover, bones are buried by the castings and brought within reach of the roots of plants.

The earthworm is thus seen to be one of the best examples which show how "great effects from little causes spring." This unpleasant looking and slimy animal, before the days of Darwin, was looked upon as an entirely useless creature, except as a bait for fish and as food for birds.—*Knowledge.*

How I Became a Paleontologist.

A Paleontologist is merely a naturalist who studies the fossil remains of animals or plants in different layers of the rocks, in order to determine the character and order of succession of the fossil organisms, or knowing this order, to determine, by the fossils found in any layer, to what part of the geological series that layer belongs. Therefore it is plain that to be a paleontologist, one must first be a zoologist or botanist, and that paleontology is merely an application of certain facts of natural history to geological problems.

I believe that one must be born with certain tastes and tendences to become a thorough naturalist, though many who have such tastes are prevented by circumstances from letting them develop in the natural way. The first of social duties is to earn one's living and it is difficult to do this and pursue the study of science at the same time, especially for young people.

I do not remember when I was not interested in nature; but that incident which led me to become especially interested in shells, was the possession, when a boy of 12 years old, of a copy of Dr. Gould's Invertebrata of Massachusetts. I then lived near the woods just out of Boston, and soon endeavored to make a complete collection of the Massachusetts shells. The sea coast being near by, most of my vacations were spent in its vicinity and my collection grew. Finding some things I could not name, I was encouraged to consult Dr. Gould himself, one of the best and most lovable of men, then living in Boston. He helped me in various ways and by none more than by this bit of advice. "You will have to earn your bread and butter very soon" he said, "and to continue doing so, but if you wish to be a naturalist do not defer your studies. You can always find some minutes every day for study, and if the time comes when you have more freedom, you will be on the road already. If you try to defer it until the freedom is gained the chances are that it will be too late." The advice was followed, books were borrowed from the libraries and few days passed that did not see some progress. School ended, I went into an office on India Wharf where I did the usual boy's work for wages which about paid for my shoe-leather, but kept a book in my desk to save unoccupied moments, and copied at odd times scientific works which I thought I should never be able to buy. An opening seemed to present itself in India, and through my dear father's kindness I was taken to Agassiz's Museum in Cambridge to learn what I might for a few months before sailing. As it happened I did not go to India, the ship on which I was to sail was burned by the "Alabama," and my months of study were fortunately prolonged.

Later, in the midst of war times, I went to Chicago to seek that livelihood which Boston did not seem to offer; and here I worked during the day and spent my evenings at scientific work in the Academy of Sciences. To Dr. Gould's rule of action I added another, that so long as I could earn enough to live on, I would invariably choose of two opportunities that which gave me the best chances for continuing my studies whether it paid better in money or not. Several times, as it seemed to others foolishly, I turned away from good salaries to harder work with less pay, but better chances for study. I believe I have never regretted it, nor had true reason for regretting it. Explorations in the Lake Superior iron regions, then in Alaska, fell to my lot, each a stepping stone to something else, To sum it up, I became a naturalist, and incidently a paleontologist, through hard work, steadily pressing in one direction, without regard to pucuniary consideration; doing always what was nearest my hand, with all my might, as well as I knew how, and crossing no bridges till I came to them. Faithfulness, energy, perserverance without grumbling or vacillation, will bring almost any one to his desired end in the course of time.—*Prof. Wm. H. Dall, Paleontologist U. S. Geological Survey, Washington, D. C., in the Outdoor World.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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esting and instructive discussions, the meeting adjourned for one week.

Our lecture, about this time, from Professor Theodore Lyman, the veteran Fish-culturist, upon the subject of pisiculture, excited in us a great deal of attention. I well remember how masterly he handled his subject, and how we admired his instructive talk upon a question of which, hitherto, we had remained in such utter ignorance; and this, as near as I can recall from the few notes I was able to take at the time, is what he said:*

"Artificial fish-culture, means the culture of fishes artificially: the surrounding of them with *conditions* of growth which shall render their growth more favorable than as it is found occurring in Nature." We understand, by this, that the lecturer would seek to take away the deteriorating environments in Nature which seek continually to undermine and undo that which she seeks continually to do, by creating fish-breeding establishments whose object shall be to assist Nature in her best endeavors.

"The true fishes," continued the lecturer, "are egg-bearing animals which lay their eggs in the water. In the salmon and trout, the female works a hole in the ground with its nose and tail in which to deposit them. The shad lays its eggs differently: it comes from the sea up the rivers to spawn, as the process of laying the eggs is called, which occurrs free in the water. They are light colored, transparent, globular, and hatch in from twenty-four to forty-eight hours. The percoid fishes make holes or nests in the sand and, after the eggs are deposited in them, watch them with great care.

"In breeding fishes one must be careful about four things: raising the young from the egg; transporting live breeders; dams; and protection from surrounding enemies."

[The following is transcribed literally from my notes. I have no means at hand for verifying the statements as I should surely do had I an opportunity. "Monks made early attempts to obtain and impregnate eggs; Lund, in 1741, but did not succeed until 1758; Jacoby first established the art of rearing the young fish from the egg, about 1761; it was rediscovered probably by a French fisherman named Renie, in 1844, who worked under the auspices of the French government. At first the eggs were destroyed. Then several scientific men took hold; the government erected a large establishment and procured fish from the Rhine and Seine for their purpose; they spent large sums of money, and found out many important things."]

"The *Salmonidæ* include the salmon, trout, whitefish (of the great lakes), smelt, and caperting, as principal types; they are all good food fish but the last." I cannot believe that the lecturer was fully aware, however, of the extent to which the latter fish is an article of food (caught, dried, and preserved for winter use) all along the coast of the north shore of the St. Lawrence, even along the Labrador peninsula, when he made the above remark. "True trout and salmon are marked by a small fatty fin just behind the dorsal. Trout vary in color, size, form, and in many other particulars. Overfed brook trout are very large." Along the north shore of the St. Lawrence and in Labrador waters, (even in Canada,) "overfed brook trout" are caught in nets and by hook and line, *weighing from two to five pounds*,—they are salted down and sold in the Canadian markets *by the barrel full.* "There is quite a difference between the fat brook trout and those taken from the sea, (the latter are females, I think, and the males do not leave their native stream.) The salmon are very lean after spawning.

"In a hatchery keep the hatching box well supplied with a good supply of fresh water—it should be kept at a temperature of 47 o to 50 o. Build a gate over the stream, behind the box, to regulate the amount of water; dig a pond or ponds, plank them inside, lead the water into them from the stream, and lead off the waste water. In the hatching-house, each separate box should have a separate stop-cock to regulate the supply of water, and also a cover to keep the insects out of it. Trout and salmon deposite their eggs on a gravelly bottom and in rapid, running water. Do not keep them together, as they eat each others spawn and young. As regards time, the hatching of the young depends upon the temperature of the water. If the water be 50 o the spawn will hatch in fifty days; and five days later for every degree lower. The eggs will sustain intense cold and yet survive. The young resemble greatly some of the fossil fishes. The trout lie helpless with an attachment of a large yolk sack for sometime before a vigorous growth begins; with salmon the time is not so long. Young fish are fed upon ox or calves' liver in a finely divided state. The enemies of both egg and young are numerous. While lying in the hatching box the eggs are attacked by a mould or fungus, which glues them together in a mass. To avoid this, cover the box with tar, charcoal, or asphalt varnish. Water insects must be watched and removed. Mice will eat both eggs and young if exposed. Keep the box covers closed, or provide them with springs, so that the light may be excluded. When once put into a stream the young will be rapidly destroyed by other fish, frogs, heron, and water snakes.

"Some fish do not run to the sea. The salmon does, and thereby gains its large size,—as no small fish of this species are found in the sea. In its natural waters, the eggs are laid at the head of some small stream, where the young may be found. They are then about four inches long with dark bars on their sides, and go by the name of *pars;* further down the river or stream are found larger fish, which have lost their bars and gained a silvery coating, these are called *smalts.* The pars change their features slowly, the smalts more rapidly, those which descend to the sea often feed so voraciously that they gain a pound a day.

"Shad are studied in this country. They belong to the herring group. When they return from the sea to spawn their stomach is almost empty yet they themselves are very fat. After spawning they return to the sea again, but often die of starvation before reaching it. Until 1867, no one had thought of rearing the young fish from the egg. Seth Greene succeeded, at South Hadley Falls, Mass., where he found the waters of the Connecticut River just fitted for his purpose. To keep them in the water and not loose them he constructed a floating box, but hatched only a few fish the first time. Then he made a box having no bottom, which he fastened with floats in the

(*To be continued.*)

*Our object in quoting Dr. Lyman's lecture, is not so much to inform one upon Fish-culture,—though in this respect we hope that it will not be without its fruits, as to show how little we knew then of a subject which, in so few years, has sprung up to be one of the most important subjects of the present day.

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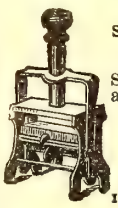

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Albion	7:00	9:10	11:35	3:25	6:50	11:06
Lockport.....	8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....	8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:25	6:45	7:50
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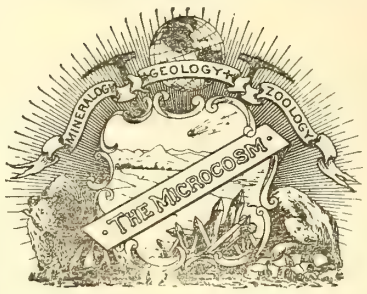

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Natural Science News.

VOL. I ALBION, N. Y., DECEMBER 14, 1895. No. 46

Natural Science News.

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Fossil Human Footprints.

BY L. W. HOFFMAN.

No fossil human footprints have ever been discovered by geologists. Others not only report them but fully believe in them. A case in point was recently brought to the attention of the writer and possesses enough of peculiar interest to warrant this communication. At the eastern base of Mt. Eve in Orange County, New York, on a bare surface of Lower Silurian limestone, occur some truly interesting rock markings. Owing to their striking resemblance to the footprints of men and animals many persons have accepted them as such, and as such common report has carried their fame beyond the immediate vicinity. The exposed rock surface, which is thickly pitted and grooved for two-thirds of its extent, lies in the bed and at the side of a brook, dry in summer, but flowing full in winter, and has a width of forty feet and a length of two hundred. It dips to the northeast, while its long axis lies northeast and southeast. The angle of dip is ten degrees. There is a bank on the east and none on the west, where it is edged by the gravely material of the drift deposits which once covered the whole rock. The markings consist of smooth depressions of no great depth. Many are circular, but some elongated. Many, instead of being formed of a single depression, have in addition to the main one, the whole forcibly suggesting as a cause the cushion of the foot and the toes of some heavy animal. Others take the exact form of a human foot without the toes. A peculiar thing is noticed. The markings for the most part occur in straight lines, either running the whole length of the exposed rock surface or transversely across it, forming tolerably perfect and even rectangles. The supposed human footprints all lie lengthwise of the current of the stream. In the longitudinal lines the elongated depressions are frequently run together, forming continuous grooves several feet in length, which retain still, however, the traces of separate cavities. Such grooves might be made in wet sand by a bare human foot, moved along with the weight on the heel.

Now all this is susceptible of easy explanation by the accepted theory of the formation of potholes. A slight depression or inequality catches a pebble and the water moves it about on this spot without having force enough to carry it away. Others are caught in the same way, and eventually the grinding action wears a hole in the rock, varying in depth and shape according to the form of the original depression, and the force of the current and the direction of its impact. A number of smaller such holes might be formed near the edge of a large one, and in that case would become incorporated with the main pothole, producing, if shallow, the semblance of the track of an animal with a cushion foot, and as many toes as there happened to be. A characteristic of these reputed animal tracks is a reckless disregard of harmony in the matter of toes. If the depression that caught the first pebble were properly situated and of the right form, a pothole would be formed with a tendency to wear away at its lower edge, and consequently it would be elongated. If another smaller one should occur just below it, two would in time run together and would present the appearance of a moccasined human foot. When the partition between the two was first broken through the pebbles would be spilled out of the upper one and the grinding would go on mainly in the lower, thus accentuating the impression of the heel and increasing the deception. Such is the explanation of these markings. They are in all stages of completion, and many still contain the pebbles that have done and are still doing the work.

But why this arrangement in regular transverse and longitudinal lines? The key to the solution of this problem lies just over a stone wall that has been built across that portion of the rock long ago vacated by the stream. Indeed, the stream had only occupied it long enough to strip it of the coating of drift which covered it, and then moved eastward, in obedience to the force of gravity, to its present position. The surface thus laid bare, but not eroded, by the water, presents an interesting sight. It is grooved and scratched in long lines, showing evidence of the action of the great ice sheet which moved up these slopes, bearing the debris of many mountain tops southward. At right angles to these scratches the rock is seamed in lines continuous with the transverse lines of potholes on the opposite side of the wall. The glacial scratches are parallel to the longitudinal lines of potholes, and, what is an important coincidence to the direction of the current in the brook. The rest need hardly be said. Some of the pebbles washed out of the drift and rolled along by the waters sought their lines of least resistance, after the lazy habit of inanimate things, and found them in the glacial scratches. Here they were caught and set to work at grinding potholes. The transverse seams caught their share also, and the result is what we see today, a most curious and vivid suggestion of an antediluvian game of fox and geese, participated in by moccasin-shod men and cushion-footed, many-toed beasts. —*Popular Science News.*

The Century Plant.

Some surprise is expressed, occasionally, that the Century Plant should die after blooming; but really, all plants of this character die after flowering, Herbaceous plants all die,—strawberry plants die after flowering,—and so do bulbous plants. The flowering portion dies away, and off-sets or suckers continue the plant. Even the pineapple has to go through the same process. It is the suckers, and not the old plants, which keep up the race.—*Meehan's Monthly for November.*

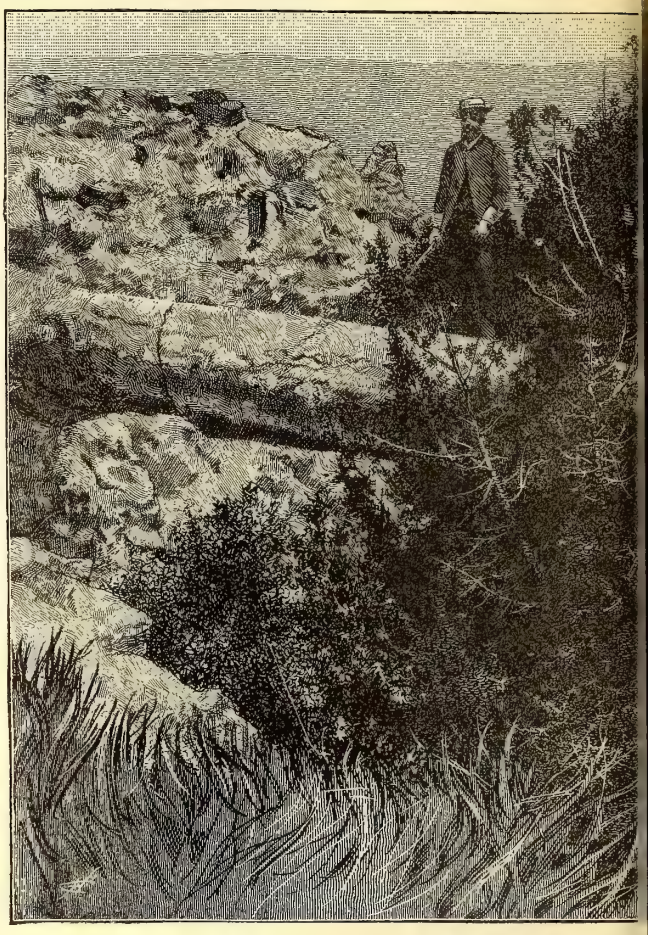
The Petrified Trees of Arizona.

At a recent meeting of the New York Academy of Sciences a paper on Some Features of the Arizona Plateau was read by L. S. Griswold.

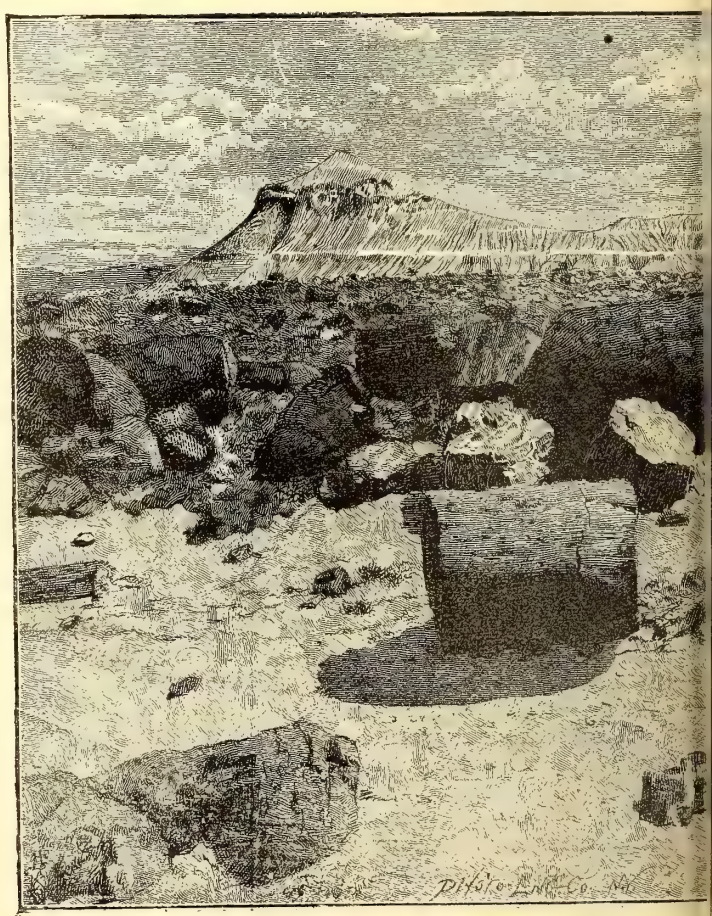
In general the plateau surface is between 6,000 and 7,000 feet in elevation above sea level and strikes one as being remarkably smooth for so high elevation; there are large stretches of nearly level or gently rolling country, diversified, however, by mesas and outliers, with escarpments rising between 50 and 200 feet, shallow but broad old stream channels now little used and leading to canons with percipitous walls. On the plateau top are numerous volcanic elevations, varying in age from the young cinder cone to the denuded stock. Over the district silicified wood is well known, occurring at the base of a gravel and sand horizon, little consolidated, belonging to the late Tertiary or Pleistocene times, and lying with slight unconformity in part upon probable Triassic strata and in part upon Carboniferous. the older formations being little disturbed.

The trees now petrified originally grew to large size, eight or nine feet in diameter for the largest probably conifers, and perhaps not very different from the forest growth of part of the present plateau. This ancient forest was apparently thrown down by the wind, for tree butts are common in horizontal position while only one was found erect. The gravel and sand covering would seem to have come soon, for only a few have fillings of sediment in hollows or give other indications of decay; the logs were buried at least fifty or sixty feet deep. The weight of the overlying sediments crushed the trees so that the horizontal diameters are commonly greater than the vertical as they are seen in place. Silicification was probably accomplished by percolating surface waters, as the logs are distant from volcanic vents, as far as known to the writer; then no hot water deposits were seen accompanying the logs, and the distribution as seen over many miles and reported much more widely would also militate against the theory of change by hot water.—*Scientific American.*

We are indebted to the Drake Company of Sioux Falls, S. D. for the use of the plates from which the above views were printed. For a more extended account of the Petrified Forest see NATURAL SCIENCE NEWS of Dec. 7th.



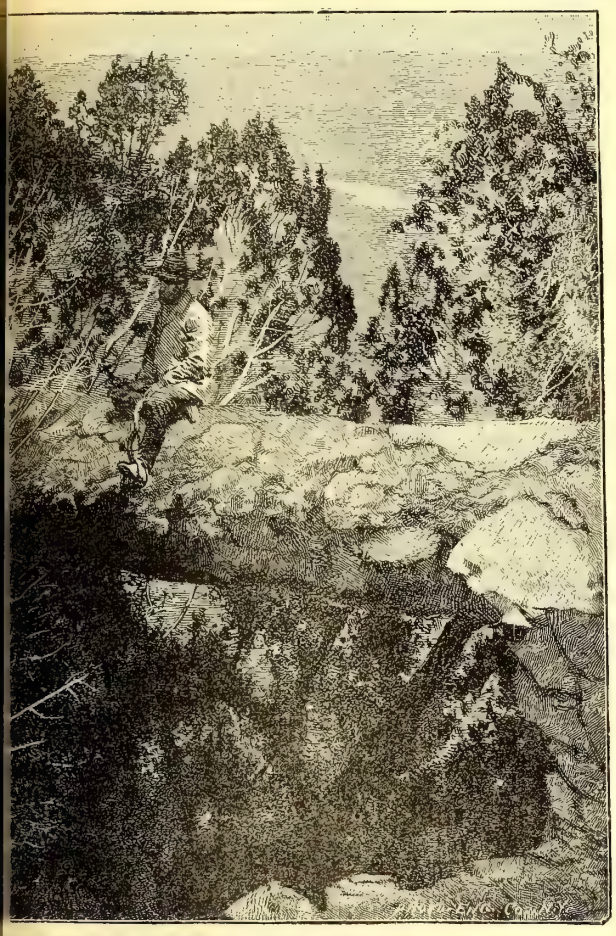
Natural Bridge of Petrified Tree 10



Views of the Petrified

The Ruined Gila Cities.

The attention of people interested in archæology and ethnology generally has long been directed to the ruins of the cliff dwellings in northern Arizona and southern Colo-



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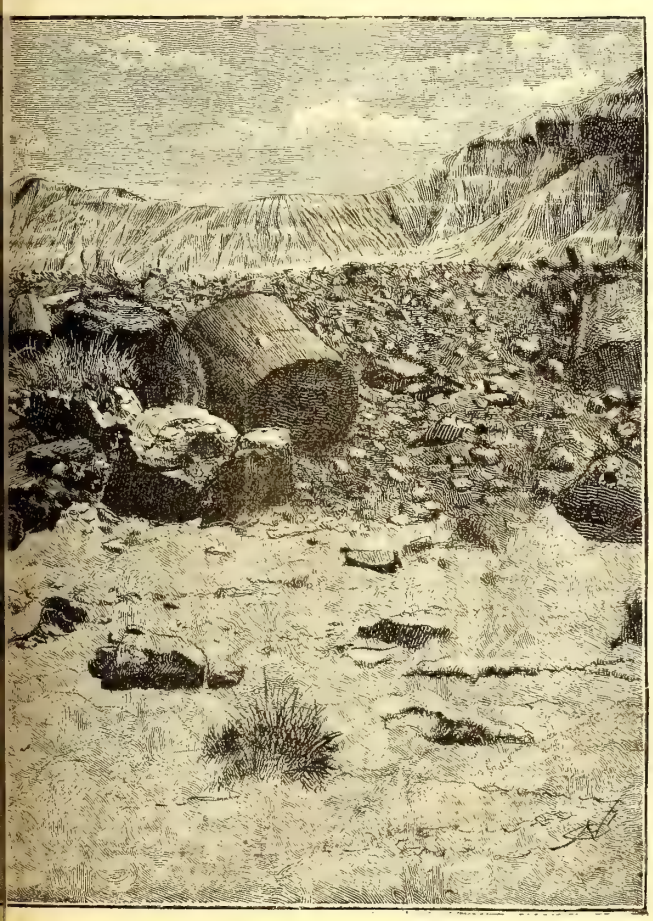

he County, Arizona.

rado, but there are comparatively few persons outside of Arizona and New Mexico who know that in southern Arizona there is a field far more interesting and of wider range. So eminent authority as Major J. W. Powell, recently of the United States Geological Survey, is quoted in support of this statement. Conservative estimates put the population of the Gila country at fully 2,000,000 when it was at its height.

The Gila remains have been but little explored because of the inaccessibility of the region, the intolerable dry heat during two-thirds of each year, and the total lack of water where it is needed. The mining prospectors who have tramped for years over all the mountains and through every valley in the Territory have given no heed to this part of the Gila country, because, no water being there, it would be useless to attempt to develop a mine even on good surface indications. An expedition under Frank Cushing did some work near Los Muertos, which is known in the Southwest as thePompeii of Arizona, but with the breaking down of his health the enterprise came to an end. The area of the country in which the remains of a prehistoric people are found is some 300 square miles. It extends from the junction of the Gila and Colorado Rivers eastward to the Superstition Mountains, and from Phœnix on the north almost to the Mexican line. Near Casa Gande the most extensive Indian remains are to be found.

The country is a ruin from one end to the other. All parts of it bear unmistakable evidences of irrigation canals several hundred miles long and built with exactness and skill, and of cities of 30,000 and 40,000 population. One can walk for miles and find every foot of the sandy surface more or less mixed with broken pottery. The paint is still on them, and is not in the least faded though it has lain exposed for ages. In the locality of Mesa City and Tempe an overflow from the Gila at some distant period washed against the ruins until they crumbled and were spread out level with the country. Back ten miles from the Gila River the ground is higher, and was once the site of a city. Portions of the wall by which it was protected are still standing more than twenty feet in thickness. Inside are the mound like ruins of the houses, which, being less durable, have crumbled. The buildings must have been very large, for in some instances the mounds are 300 feet in length by 200 in width and 20 in height. The space enclosed by the wall is about fifty miles by three.

(*To be continued.*)

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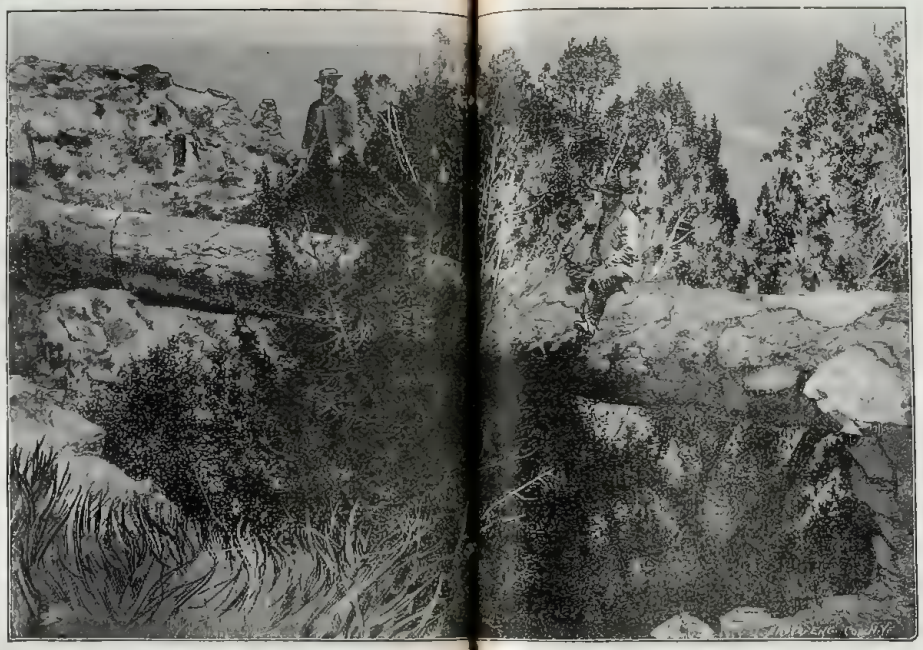
The attention of people interested in archæology and ethnology generally has long been directed to the ruins of the cliff dwellings in northern Arizona and southern Colorado, but there are comparatively few persons outside of Arizona and New Mexico who know that in southern Arizona there is a field far more interesting and of wider range. So eminent authority as Major J. W. Powell, recently of the United States Geological Survey, is quoted in support of this statement. Conservative estimates put the population of the Gila country at fully 2,000,000 when it was at its height.

The Gila remains have been but little explored because of the inaccessibility of the region, the intolerable dry heat during two-thirds of each year, and the total lack of water where it is needed. The mining prospectors who have tramped for years over all the mountains and through every valley in the Territory have given no heed to this part of the Gila country, because, no water being there, it would be useless to attempt to develop a mine even on good surface indications. An expedition under Frank Cushing did some work near Los Muertos, which is known in the Southwest as the Pompeii of Arizona, but with the breaking down of his health the enterprise came to an end. The area of the country in which the remains of a prehistoric people are found is some 300 square miles. It extends from the junction of the Gila and Colorado Rivers eastward to the Superstition Mountains, and from Phœnix on the north almost to the Mexican line. Near Casa Gande the most extensive Indian remains are to be found.

The country is a ruin from one end to the other. All parts of it bear unmistakable evidences of irrigation canals several hundred miles long and built with exactness and skill, and of cities of 30,000 and 40,000 population. One can walk for miles and find every foot of the sandy surface more or less mixed with broken pottery. The paint is still on them, and is not in the least faded though it has lain exposed for ages. In the locality of Mesa City and Tempe an overflow from the Gila at some distant period washed against the ruins until they crumbled and were spread out level with the country. Back ten miles from the Gila River the ground is higher, and was once the site of a city. Portions of the wall by which it was protected are still standing more than twenty feet in thickness. Inside are the mound like ruins of the houses, which, being less durable, have crumbled. The buildings must have been very large, for in some instances the mounds are 300 feet in length by 200 in width and 20 in height. The space enclosed by the wall is about fifty miles by three.

(To be continued.)



Natural Bridge of Petrified Tree 108 Feet Long. Diameter of Exposed Part, 4 Feet.

Views of the Petrified Forest, Apache County, Arizona.

PENIKESE—A Reminiscence.

By One of its Pupils.

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river. In this he hatched the fish in sixty hours. At first they were small and greatly resembled the larvæ of mosquitoes. When let into the stream they immediately sought the middle of the river. Trout and salmon seeking the banks. As they descended they grew rapidly. In two years time they returned as *chicken* shad; perfect males and females, and marketable. They go down the river in September. They do not migrate, as many would suppose, but the fish from each river keep distinct. The fisherman tell, by the intensity of color, what waters they are from. They appear in Savannah, Georgia, in February; in Washington, D. C., in March; in Massachusetts, in June.

The eggs of fishes differ in size. In the trout and salmon there are about 1,000 eggs to the pound; in shad, 30,000; in some larger fish, as many as 70,000. Some fishes cannot be bred artificially—it then becomes necessary to transfer live breeders. These generally lay their eggs, not in mass but singly. The fish themselves must be delicately handled, as a damage to their skins usually results in death. Black bass will grow to a weight of thirty-five to thirty-six pounds. They were transported from Saratoga Lake in 1850. They must be kept in water of a certain temperature, the water being frequently changed. Trout can be transported to a great distance. Fish are transported from water to water by fish-ways. The greatest enemy of the trout is the pickerel."

CHAPTER VIII.

Morse vs. Putnam on Evolution; The End.

It was during this second year's course at Penikese Island, that the lectures upon evolution by Professor Morse and arguments against that theory, by others of the professors, formed a distinctive feature of our instruction.

Professor Morse was evidently an ardent evolutionist,—at least one would judge so from his lectures and personal conversation upon the subject. He gave us many interesting talks upon it— and seemed to have no patience with any one who did not think as he thought, or believe as he believed regarding it. Some of his oft-repeated and apparently pet expressions were: "As you culminate in any group, you find features similar to those of the higher vertebrates," or, "there are no forms but that, in their culmination, point to the vertebrates;" still again, "certain parts of the mollusks show a resemblance to man,—as, for example, the eye and nerve ganglion, protected by a form covering, suggests the skull."

I well remember how once the professor illustrated the progression of animal life from the lowest invertebrate to the highest vertebrate by an admirable, systematic tree of trunk, branches, and twigs, even, shooting here and there all over the blackboard, and ended by declaring the precepts of the evolution of man from all this treey and twigy matter. Unfortunately, however, man was made to appear at the extremity of one of these insignificant branchlets. As a result—during the evening of the same day, the figure remaining upon the board during that time, some mischievious person made, naturally enough as far as simple appearances went, a few additional branchlets to the limb of man with the words "man in 1900?" One can imagine the scene which followed upon the discovery of the marks: the consternation of the professor, and the good-natured raillery of the scholars. But this did not deter him from further lectures upon the subject; or we, who listened, from asking ourselves, like Pilate of old "what is truth" in this matter.

Of course not all who heard his lectures fully agreed with Professor Morse in everything which he said,—in fact, I am of the opinion that the majority rather sided against than in favor of his theories; yet, personally, he was a great favorite with everyone, and was greeted with a perfect storm of applause whenever he appeared amongst us—nor will we soon forget the apparent interest and enthusiasm with which he always entered upon his subject,—nor was that interest weakened, in either instructor or pupil, to the end.

I will now give you the substance, as fully and as clearly as my notes will allow, of Dr. Morse's most important arguments in favor of the theories of evolution and natural selection. He began as follows:—

"I come before you tonight, to say a few words upon a subject quite foreign to my usual one—the molluscous branch of the invertebrate kingdom. It is one which I think ought to be presented to you in a fair way, as it is one which is now agitating the whole world. I will not ask you to believe the evidence to be set forth against your better judgments; but I ask your attention while I explain, and lay before you, the views which are held by those who are supporters of the evolution theory, and supporters of Mr. Darwin; and I think you will see that it is not so terrible a thing to suppose man originated from a branch of the lower or animal kingdom, or, in other words, from the ape, after all.

"It is well known that all animals, in some form or other,—either in their adult or in their embryonic stages—resemble other animals, higher or lower, in *their* adult or embryonic stages; and that all classes have forms that are almost impossible to be separated from, or are intermediate between, two kingdoms: For instance,—many of the lower forms of *polyzoa* cannot be definitely separated from many of the *algæ* or seaweeds, which, at a certain period of growth, throw out free forms having small bodies with a tail at each end, and which move about freely in the water. Thus the two forms, the animal and the plant, are so similar that a definite study of each is absolutely necessary in order to separate them with any degree of satisfaction—if not at all. Such a study has not as yet been made,—and, undoubtedly, when it *is* made, many errors in our belief concerning them will be corrected, if not our whole classification of them altered. Then, too, we have many animals in the insect or articulate branch, which insensibly run into each other and into others of other branches, —these are so closely allied as to be almost inseparable if not quite so. Now to what does all this tend?

"Many of the old scholars of science classified the animal kingdom in such a way that there were no intermediate forms—by placing the doubtful genera and species in separate and distinct groups; thus representing the whole animal and vegetable kingdoms by separate and distinct groups, also. But we see, now, that this is contrary to their general structure, and opposed to true classification. If we represent the old classification by a series of straight lines, we shall have a good illustration of the relation of the old orders (or, better, branches) to each other; or even if the lines were placed in an inclined direction, one line being above the other, we shall still have a

(*To be continued.*)

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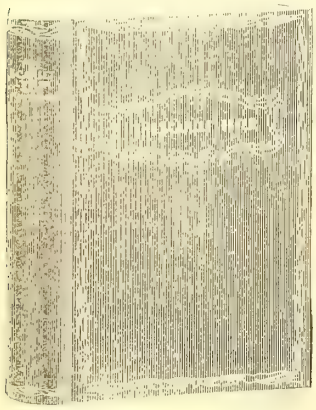

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Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
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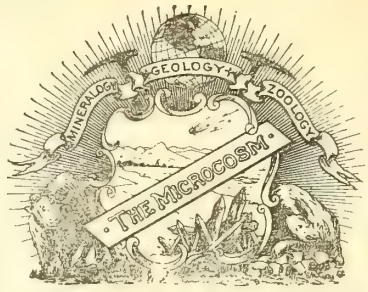

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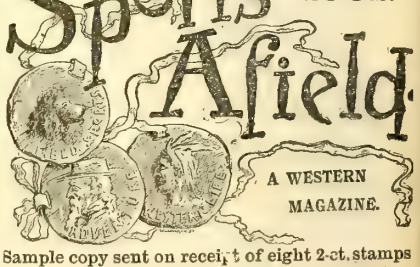

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The Ruined Gila Cities.

(*Continued from last week.*)

Much of the country is very little higher than the present bed of the Gila, and at one time a branch of that stream must have flowed into a basin and formed a natural resorvoir. There was a rise of about ten feet greater at one point between the basin and the river, and the sandstone formation shows unmistakable signs of having been cut by artificial means, perhaps with the idea of assisting the entrance of the water by enlarging the passage. Five canals lead out of the basin, all on the south and west, which confirms the belief that it was once a resorvoir formed chiefly by natural causes, and used to store water against the periods of drought. The prehistoric city is laid out north and south, at least, in a majority of instances the streets run to the cardinal points. The walls seem to vary a little from this rule; in fact, are crooked in places, as if they might have been constructed for the support of bastions or towers. This city and the one containing an old fort further down the river are the only ones in which the writer ever found any evidence of preparation for war. It seems as if the races who lived in this Gila country were either so numerous that they feared no attack or they had no enemies with which to contend. South of Phœnix, on the mesa, are the ruined corrals or stock pens in which their animals were kept. Many finds prove the purpose for which they were used. What the animals were is not so easily determined. On slats found in ruins south of the Salt River are splendid figures of llamas. In the ruins that have best withstood the exposure of the ages many interesting specimens of the creamic art have been found. Ollas of all shapes and sizes, urns containing the ashes of the dead, and jars partly filled with parched corn and beans are found in a remarkable state of preservation. It seems as if the entire city had been swept by a flood and the earthen house melted down, or they were shaken by an earthquake and toppled into a thousand fragments, giving the inhabitants barely time to escape. Few of the skeletons that the amateur diggers in the ruins have taken out show signs of mutilation or have broken bones. The people appear to have died of suffocation or some natural cause that left no mark upon the frame. In working in several spots where bones have been found deeper digging has brought to light large quantities of bone dust as fine and light as gunpowder. In one spot near Tempe, several tons of bone dust have been found recently, lying in what appears to have once been a trench some seventy feet long and two deep, nine feet below the surface of the sun-baked earth. The edges of the deposit of bone dust were broken and uneven, so that it could not mark a place of burial. Does it consist of the remains or animals or is the dust that of humau beings? If the latter, was it the result of funeral rites, or were the bodies deposited there by some great flood that came over the land without a warning? The majority of the skeletons discovered in the Gila Valley are in good condition, and it is therefore not easy to reconcile this fact with the finding of the great deposits of bone dust.—*New York Sun.*

The Formation of Coal.

Carbon is the principal element in the composition of coal. A good specimen of hard dry anthracite would show from 91 to 98 per cent. of carbon. The average anthracite of commerce, know technically as semi-anthracite, would show from 85 to 90 per cent., and the bituminous and semi-bituminous varieties would range all the way from 50 to 85 per cent. The amount of volatile matter contained increases from three per cent. in the anthracites to 38 per cent. in the bituminous species. The conduct of these different kinds of coal in combustion gives practical emphasis to the difference in composition. The anthracites burn with a small blue flame of carbonic oxide until thoroughly ignited, give off no smoke, and leave a comparatively small percentage of ashes. The bituminous classes, on the other hand, burn with a continuous yellowish flame, give off considerable smoke, and leave a large percentage of ashes.

That coal is a vegetable product may be specifically proved. Indeed, ocular demonstration may be had of that fact. For while to the naked eye the structure of a fragment of mineral coal is purely amorphous, yet if that fragment be made so thin that it will transmit light, and if it be then examined through a powerful microscope, its vegetable structure will be readily distinguished. Heat, pressure and confinement have produced the transformation. It is simply a process of smothered combustion. The operation may be watched in any peat bog. A peat bed is simply an accumulation of the remains of plants which have grown and decayed, and have been year by year buried more deeply under succeeding growths. Remove the upper layer, and you find peat with its 52 to 66 per cent. of carbon. The deeper you go, that is, the older and longer buried the product, the better will be its quality for fuel. If this process of deposition should continue through many geologic ages, the result would doubtless be true coal.

It is known that during the carboniferous age the area now covered by the Middle, Southern and Western States was little more than a vast marsh burdened with the most luxuriant vegetation. The conditions were all favorable for the rapid and enormous growth of plants. The soil was rich and moist. The heat was greater than exists to-day at the torrid zone. The humidity of the atmosphere was great and constant. The air was laden with carbon. Plants luxuriated in it. They grew to enormous sizes. Plants which in our day are mere stems, a fraction

View of the Petrified Forest, Apache County, Arizona.

of an inch in diameter, were in that time represented by trees from one to three feet in diameter and from 40 to 100 feet in height. This mass of vegetation, including more than 500 different species, was constantly growing, falling and decaying, each succeeding growth forming a still richer bed for the vegetation to follow.

If the theory propounded by Laplace is correct, our earth was at one time a ball of liquid fire. Cooling and condensation progressed from the surface toward the center. Contraction of the earth's crust necessarily followed, and vast areas of land sank and were covered by the waters. This process was still going on during the carboniferous age. The submergence of a bed of this incipient coal meant the cessation, for a time, of vegetable growth from its surface. That surface was covered instead by the sand, mud and gravel washed over it by the waves, by the drift from higher levels, and by the limestone deposits swept up to it from the sea. When contraction ceased for a time and the earth's crust again became stable, the waters began to recede, leaving behind them great wastes of mud and sand. And, following this slow recession to the sea, vegetation crept once more over the surface ot the land, the soil grew rich with the products of decay, and plant life reigned and rioted anew. But cooling and contraction of the earth's body were going continuously on, and submergence followed again and again, each bed of vegetable matter, thick or shallow, being covered in turn by its layers of sand and silt.

In this submergence and burial of the deposits of the coal era we find all the conditions necessary for the transformation of vegetable matter into coal. Only from one-ninth to one-sixteenth of the mass of vegetable matter subjected to this heat and pressure was retained in the form of coal. This was largely carbon, the hydrogen and oxygen having been expelled. As we have already seen, the anthracite coal contains a much larger precentage of carbon than does the bituminous, and a much less quantity of volatile matter. Of the immense coal areas in the United States only an extremely small percentage are of the anthracite variety, and these all lie in the State of Pennsylvania, east of the Allegheny Mountains, with the exception of a small field in Rhode Island. It is not thought that the vegetable life which entered into one class differed in any material respect from that which entered into the other.

The presumption is natural, if not conclusive, that prior to the close of the carboniferous age all the coal deposits had been bituminous in character, but that the violent movement of the earth's crust at the time of the Appalachian revolution, the enormous pressure and intense heat, were sufficient to expel a large portion of the volatile matter from the bituminous coal beds, and otherwise change their character into what we now class as anthracite. In the slate strata immediately overlying each coal seam, it is common to find the impressions of twigs, nuts, seeds, leaves, the most delicate fern tracery, and the trunks of great trees mashed flat between the layers; while in the softer beds of cannel coal, whole trees have been found, roots, trunks, branches, leaves, seeds, and all transformed into like material with that by which they were surrounded. One of the results of the violent disturbances of the earth's crust already noted was to leave great rents in it across the lines of strata. These rents are known geologically as fissures. They have faces which are either parallel or inclose a wedge shaped cavity. Sometimes igneous rock from the molten mass below was forced up into these openings; sometimes the cavities were filled with drift and rock fragments from the surface. In either case the

mass became hard and compact, but with a character materially different from the rock on either side, the formation of which was contemporaneous with that of the coal.

The mind must exert itself to the utmost in order fully to realize through what vast periods of time the processes were continued by which the coal of to-day was formed. Still more difficult of comprehension is the fact of the enormous amount of vegetable matter which entered into the composition of these beds of coal. In the Pottsville regions in Pennsylvania the average thickness of the combined anthracite coal seams is 120 feet. In order to make up this quantity of resultant coal, there must have been an average thickness of vegetable deposit amounting to at least 1,200 feet.—*New Science Review.*

Extermination of the Buffalo.

The game of the West has rapidly disappeared before the huntsman's rifle. It is a fair estimate that four million buffaloes were killed within the five years between 1874 and 1879, from what was known as the Southern herd, which roamed through northern Texas, the Indian Territory, Kansas and Nebraska. Between 1878 and 1883, the great Northern herd —quite as numerous—roaming through the Dakotas, Wyoming, and Montana, were destroyed in like manner. The hunters received on an average from $2.50 to $3.00 per hide, to be shipped out of the country and sold for leather making, belting, harness, and kindred purposes. Many thousands of men were engaged in the enterprise. The most successful hunting parties consisted of a hunter and about six men known as strippers. The time usually selected for taking the buffaloes was just after they had been grasing in the morning, had gone to the water and then returned to the high ground, lying down to rest in bunches of from twenty to a hundred. The hunter, with the longest range rifle of the heaviest caliber he could obtain, would fire from the leeward side, so far away that the crack of the rifle could not be heard by the buffalo, and being behind a bunch of grass, could not be seen. In that way he would kill from a dozen to a hundred a day, without disturbing the herd to any great extent. The buffalo receiving a mortal wonnd would bleed to death, while the others about him, smelling the blood, would sometimes come near him and paw the ground, and so stand until they too would receive their death wounds. The strippers would then come up with ox teams, take off the hides, place them in the wagons, and transport them to the nearest railroad station, whence they were shipped to market. At one station alone on the Atchison, Topeka and Santa Fe railroad as many as 750,000 hides were shipped in one year.

After the hides were removed, the carcass would be poisoned in many cases, some yearling buffalo being geuerally selected, and next morning there might be found forty or fifty dead wolves lying scattered around, victims of strychnine. In this way large game was rapidly destroyed, together with countless numbers of wolves that had thrived only by preying upon them. This might seem like cruelty and wasteful extravagance, but the buffalo, like the Indian, stood in the way of civilization and the path of progress, and the decree had gone forth that they must give way. It was impossible to herd domestic stock in a country where they were ccnstantly liable to be stampeded by the moving herds of wild animals. The same territory which a quarter of a century ago was supporting those vast herds of wild game is now sustaining millions of domestic animals which afford the food supply to hundreds of millions of people in civilized countries.—*North American Review.*

Changes in the Habits of Animals.

An impression prevails that insects and other creatures are so corelated with their food that they can scarcely exist unless the special food seemingly essential to them is ready to hand. This is believed true not only of food, but of their habits in general. The yucca and the yucca moth are so closely connected, that it does seem as if each is absolutely dependent on the other,—and one might well ask what would the chimney swallow do without chimneys in which to build its nests,—or cherry or peach tree gum with which to build them.

But just as the vegetarian would have to abandon his principles when there was nothing in the icy region but musk oxen and walrus to feed on,—so animal nature generally has the instinct of preservation to take to that which first comes to hand, when favorite resources fail. The chimney swallow built its nest somewhere before the white man constructed chimneys. The potato beetle had its home on the plains long before it ever knew a potato; and the writer has sèen the common elm-leaf beetle, feeding voraciously in the mountains of North Carolina on a species of skull-cap—*Scutellaria*—touching apparently no other plant, in localities where elms were absent. In Germantown gardens, half starved bees take to grapes and raspberries. In the same locality, the common robin has had hard times. There has been no rain from the 4th of July to this date (October 11th), and everything having become parched long since, insects that live on green food have not increased. The robins have taken to green seeds and fruits. The apples on the orchard trees are dug as if by mice. An American golden pippin, with a heavy crop, presents indeed a remarkable appearance with what should be apples hanging on the trees like empty walnut shells. In brief, no creature will ignore the promptings of nature. It will change its habits when necessity demands.—*Meehan's Monthly for December.*

The Glow Worm Caves of Tasmania.

At a meeting of the Royal Society of Tasmania, an account of some fine caves that have been discovered near Southport, Tasmania, was given by a Mr. Morton, who had visited them. They are situated about four miles from Ida Bay, and a fairly good road leads to them. The entrance is through a limestone formation. A strong stream flows along the floor of the chambers. The first chamber entered by Mr. Morton and those who accompanied him showed some fine stalactites, and along the floor some fine stalagmites were seen. On the lights carried by the party being extinguished, the ceiling and sides seemed studded with diamonds—an effect due to millions of glow worms hanging to the sides of the walls and from the ceilings. Further on several chambers were explored, each revealing grander sights. The time at disposal being limited, the party had to return after traversing a distance of about three-quarters of a mile, but from what was observed the caves evidently extended a distance of three or four miles. The only living creatures seen were the glow worms.—*Scientific American.*

PENIKESE—A Reminiscence.

By One of its Pupils.

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very good representation of the way in which the animal kingdom was classified by the old writers,—though each writer represented them by a different number of branches and orders: one conceding seven branches and twenty-eight orders; and another, eleven branches and seventeen orders; and so on.

"As I have said before, we know that many genera run into each other in such a way that they are almost wholly indistinguishable from one another, perhaps quite so. We cannot place these doubtful forms in separate families,—for it will not only show that we have not tried to separate them and give them their true places, but that we have built up a false classification, that cannot stand because it has no foundation. Now! what we evolutionists claim is, *not* that these branches are distinct creations, created to puzzle the naturalist, but that they are diverging species from branches that insensibly run into each other, in the same way that two unparallel lines will, at some time, meet, however different they are at their extremities. Thus we think that the letter V should be the symbol of the evolutionist; thus you will see how one branch insensibly runs into another, and why it is we find no intermediate forms—why it is, also, that the 'missing link' of Darwin, as it is called, is an animal to be dreamed of rather than to be actually seen.

"Now to prove more completely this nearness of relation, this running of one group into another, let us take some division of the animal kingdom which it would seem impossible to connect with anything but itself. For instance—everybody knows a bird by its feathers. But, if we examine its skeleton, we find that it corresponds to a reptile standing upon two legs; with the front legs slightly modified to suit a different sphere of action, the long tail off—to effect a balance, and the head slightly altered to suit a change in food. Note, now, the result of investigation! An animal was found, some years since, with such truly reptilian characters, that even the best anatomists thought that it was a reptile. At first, all of the parts of this wonderful animal were not discovered; but, little by little, the remaining parts came to light, until the discovery of the head, by Professor Marsh, completed the skeleton. All of its characteristics, save one, were reptilian, and, but for that one, it would have been considered the skeleton of a reptile: In place of the four legs there was a wonderful development of the two wings of a bird, slightly modified to suit the form of the animal, and from these wing-shaped structures proceeded actual feathers. There was the central shaft, the barbs, and the barblets clearly defined—leaving no doubt whatever as to the identity of the animal in question. It was a reptilian bird. And so we find two orders, or rather branches, which it seemed at first sight impossible *not* to distinguish, so running into each other as to present an animal possible to belong to either. A connecting-link, as we would call it, between the birds and the reptiles. What can this be but the development of the one into the other? Here we have a means of communication between the two branches,—but this is not all.

"Again, look at the embryonic stages of the bird and some of the higher reptiles and you will find, that, at a certain stage, the young bird is, apparently, identical in structure with tbe young reptile. Place the two, at that stage, side by side, and you will fail to tell which is the bird and which the reptile. It is only at a further stage of the development that the characteristics begin to change, and the bird assumes the elongated beak, and the webbed toes, which, at a certain stage, are found in all bird embryos; the front legs then assume the form of wings, and the tail is lost. The reptile retains its peculiarities."

The professor here entered into a long and very scientific discussion, by which he considered it proven, beyond further, reasonable doubt, that "tarsal, true tarsal bones," existed in birds, and could be discovered, under medium powers of the microscope, in the embryo, at a certain stage of its development. This he affirmed, proved "another point of connection between the birds and the reptiles"

Still continuing, he says:—

"With a few exceptions, ante-evolutionists are merely species describers. They are careless of dero conditions and circumstances may alter growth; and are endeavoring to build up monumens for themselves by describing new species. Now if evolution be true, down will go their species." (The professor had been talking particularly of mollusks,—but whether of the *Unios* or of the *Land* shells, the notes do not state). "Look at the difference in the number of species abroad and in this country. In England they have been reduced to about forty; and an eminent naturalist has taken some dozen of these and, by subjecting them to different circumstances, actually reduced that number. If this can be done in a short period of time, what might we not expect in looking back for one or even two hundred thousands of years? Take the species in New England, some twenty; and then go to the western portion of the United States,—in Ohio, Tennessee, and the tributaries of the vast Mississippi—surrounded on the north by the Laurentian chain, on the east by the Alleghanies, and on the west by the Rocky mountains—one vast basin! and we find species living in the brackish pools of water that are identified with those living in the sea. In the fresh water we find living species that are identical with those living in the brackish water. These all go by different names, because found in different localities; but they are so absolutely identical that, if placed side by side it is impossible to separate them. This is true of a great majority of our species—so called. Now what is the cause? It is clear enough to my mind. The sea, formerly, filled this large basin, and, gradually receding, left those large rivers which, after being nourished by the rain for years, grew fresh retaining many of their old and more hardy forms of animal life from the ocean. These forms, in turn, gradually became changed so as to sustain life in brackish, and then in fresh water. This process of change of living to suit a difference of environment, can now actually be performed with some of our species. Thus we find, that it is possible to take forms, which if introduced directly into fresh water would be instantly killed, and by gradually modifying their circumstances, cause them to become actual inhabitants of fresh water and, in the naturalists' estimation, new species.

"Professor Hooker took Alpine plants and brought them to the foot of the mountain upon which he found them, and, in a few years, actually succeeded in producing plants which, in every respect, differed from the originals, yet combining certain characters which proved them identical with a species of a wholly different name and genus. By and by the naturalist will be endowed with prophetic vision, as it were, and be able to tell *when* to expect certain modifications, and *where* to find them.

(*To be continued.*)

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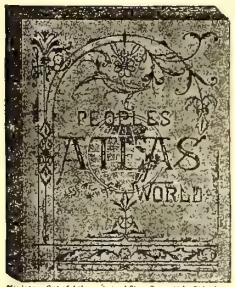

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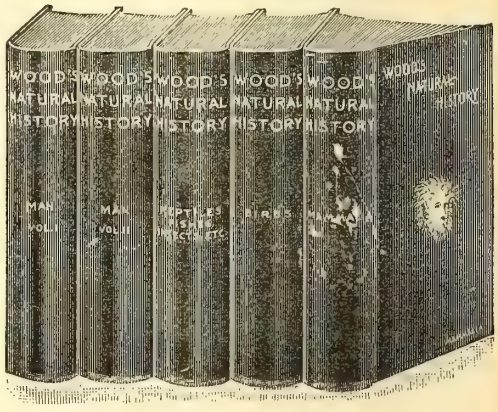

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Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:09
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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5. " filamentosa, 1 to 3 inch..... 2
6. Cardium magnum, 3½ to 4 inches..... 6
7. " muricatum, 1½ inch single valves 1
8. " serratium, 1 to 2½ inch..... 3
9. Arca ponderosa, 2 to 3 inch..... 3
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11. " floridanum, 2 to 2½ inch..... 3
12. Cytherea (callista) gigantea, 3 to 5 inch..10
13. " " maculata, 1 to 2½ inch 6
14. Natica duplicata, 1 to 3 inch..... 2
15. Chama Arcinella, 1 to 2 inch..... 5
16. Dosinia discus, 2 to 4 inch 5
17. Pholas costatus, 3 to 6 inch, double valve..15
18. Murex pomum, 1 to 3 inch..... 3
19. " salleanus, 1 to 3 inch 5
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31. Turritella, 1 to 1½ inch..... 2
32. Tellina, ½ inch..... 1
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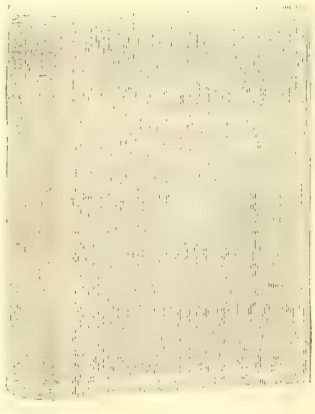

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The Confederate Note.

Representing nothing on God's earth now,
And naught in the waters below it,
As a pledge of the nation that's dead and gone
Keep it dear Captain, and show it.
Show it to those that will lend an ear,
Tell the tale this paper can tell
Of liberty born, of the patriot's dream,
Of a storm-cradled nation that fell.

Too poor to possess the precious ore,
And too much a stranger to borrow,
We issue today our "promise to pay,"
And hope to redeem on the morrow.
Days rolled by and weeks became years,
But our coffers were empty still;
Coin was so rare that the treasurer quakes,
If a dollar should drop in the till.

But the faith in us was strong indeed,
And our poverty well we discerned,
And these little checks represented the pay
That our suffering veterans earned.
We know it had hardly a value in gold,
Yet as gold the soldiers received it;
It gazed in our eyes with a promise to pay
And each patriot soldier believed it.

But our boys thought little of price or pay
Or the bills that were over due;
We knew if it brought our bread today,
'Twas the best our country could do.
Keep it! it tells our history over,
From the birth of the dream to the last;
Modest, and born of the angle Hope,
Like our hope of success it passed.

The following lines were found written upon the back of a Confederate note just after the close of the war.

A Submerged Forest.

Many years ago, even so far back that the traditions of the oldest Siwash extend not thereto, there was some vast upheaval of Mother Earth on the shores of Lake Samamish that sent a portion of the Newcastle hills sliding down into the lake, with its tall evergreen forest intact, and there it is to this day. About this time of the year the waters of the lake are at their lowest, and then the tops of the tallest of these big submerged trees are out of the water, but never more than ten or twelve inches.

Unfortunately for the curiosity seeker and traveling public generally the submerged forest is on the opposite side of the lake from the railroad and the station of Monohon, and very few people ever see the phenomenon unless they take the time and pains necessary to reach it.

Sam Coombs, the pioneer, is very enthusiastic concerning its beauties and mystery. He talks Chinook fluently, but with all his quizzing of the red-skinned inhabitants he has never learned anything that will throw any light on the history of the deep forest under water. The waters of the lake are very deep, and the bluffs back of the beach very precipitous, so that the only explanation of the freak is that either by an earthquake or some other means a great slide has been started in early times, and it went down as a mass until it found lodgment at the bottom of the lake. At this time one can see down into the glassy, mirror-like depths of the lake for thirty feet or more. Near the banks the forest trees are interlaced at various angles and in confusion, but further out in the deep water they stand straight, erect, and limbless and barkless, 100 feet tall. They are not petrified in the sense of being turned to stone, but they are preserved and appear to have stood there for ages. They are three feet through, some of them, and so firm in texture as to be scarcely affected by a knife blade. The great slide extended for some distance, and it would now be a dangerous piece of work for a steamer to attempt passage over the tops of those tall trees. Even now the water along shore is very deep, a ten foot pole would sink perpendicularly out of sight ten feet from the shore line.

All over this country are found strata of blue clay, which in the winter season are very treacherous, and given the least bit of opportunity will slide away, carrying everything above with them. This is the theory of the submerged forest of Lake Samamish. It probably was growing above one of these blue earth strata, and heavy rains, or probably an earthquake, set it moving. The quantity of earth carried down was so great that the positions of the trees on the portion carried away were little affected. It is hardly to be believed that the earth suddenly sank down at this point and became a portion of the beautiful lake.

Few such places exist. There is a place in the famous Tumwater Canon, near Leavenworth, which is in some respects similar. At some early time a portion of the great mountain side came rushing down and buried itself at the bottom of the canon. Now there is a considerable lake, and in the center stand tall, limbless trees, different in species from those growing along the canon.

At Green Lake, near Georgetown, Col.—a lake which is 10,000 feet above sea level—is a submerged forest of pine trees, some hundred feet tall, but not so numerous as in Lake Samamish. This same theory explains their presence as given above.—*Seattle Times.*

A Grafted Snake.

According to the San Francisco *Chronicle*, a Dr. G. A. Countryman, of Mallette, S. D., possesses a combination snake. It is half garter and half sand snake, and the peculiar combination was made possible by a surgical operation performed by the doctor. His attention was directed to snakes from observing that when a snake was killed its tail appears to live until the sun goes down, when life ceases. It is thought by many that this is owing to the nerves, but the doctor was somewhat skeptical on this point. Being a surgeon he dissected several, and made some interesting discoveries. He found that in both the sand and garter snakes the spinal column extended little more than half the length of the body. Knowing that it was possible to graft flesh, this led him to chloroform them and try splicing them, making the splice, of course, below the end of the spinal column.

He made four unsuccessful attempts, but succeeded in the fifth.

The grafted snake he has now is apparently in good health and the joined parts are perfectly knitted together. Its body is of the sand snake and the tail is a garter snake's.—*Scientific American.*

The Strangest Insect in the World.

With reference to the article on the above subject will you permit me in the interests of scientific pursuit to remark that up to the present the moth which produces the caterpillar attacked by the fungus *Sphaeria Robertsii* is not known to scientists, though it is surmised to be a member of the genus *Hepialus* or swift moths of Europe? It was formerly thought to be *Hepialus virescens*, the giant green moth of New Zealand, called by the *Maoris pepe*, but that cannot be, as *virescens* is a wood borer and undergoes all its transformations chiefly in the lower parts of the trunk of the New Zealand currant or wine berry tree, *Aristotelia racemosa*, and occasionally in other trees, such as manuka, leptospermum, the black maire, *Olea apetela*, etc.

The vegetable caterpillar, hotete (Maori), evidently pupates in the ground, and some must escape the attacks of the fungus spores to perpetuate the species, though the pupa has yet to be satisfactorily accounted for. From information obtained by my eldest son, G. H. Grapes, from the Maoris at Otaki, North Island, it appears that the grub or caterpillar pepeaweto (Maori) which begets this curiosity is dark olive green, about three inches long and found an inch or so beneath the surface of the soil, but, so far as I can ascertain, has never been seen by an entomologist. Specimens in my possession prove that the head is not the sole point of attack, but that both extremities are attacked indifferently; indeed, my experience tends to the belief that the anal extremity is the oftener selected by this singular and mysterious parasitical growth. The twig-like woody appendage is sometimes forked, and in one of my specimens exceeds 9 inches in length. The attacks of *Robertsii* seem altogether confined to the extremities of the caterpillar, unlike an allied British species, *Isaria farinosa*, which attacks the larvæ of the cabbage moth, *Mamestra brassicæ*, on the anal, dorsal, and abdominal regions indiscriminately. Parasitic fungi are met with in Australia and other countries which attack living and dead larvæ, pupæ, etc., consisting of upward of twenty-five recorded species, but none are so conspicuous or so remarkable, that I am aware of, as *Sphaeria* (formerly *Torrubia*) *Robertsii*, examples of which may be seen in many museums. Finally, I observe that "Aweto" is the Maori appellation for the larva of the New Zealand convolvulus hawk moth, *Sphinax convolvuli*, frequently seen feeding on the kumara or sweet potato, *Convolvuls chrysorrhizus*.—GEORGE J. GRAPES, Caebroi Paraparaumu, North Island, New Zealand, *in Scientific American.*

Destruction of Forests in California.

In the University of California Magazine Mr. Charles H. Shinn, in writing of the lavish way in which the best parts of the California forests have been cleared away, states that in the Comstock mines alone enough timber has been used to build all the houses needed for a city of 50,000 inhabitants. He has seen the bottom of a canon crowded for miles with the trunks of pines from each one of which a few flume blocks or a log of butt timber had been cut, while the rest was left to decay. Not to mention the thousands of acres of the most magnificent coniferous timber known to man destroyed by fires which have burned out the soil itself into great pits, it is stated that the waste of timber in the redwood districts has been even more appalling than it has been in the Sierras. More than once the world's record for the number of feet cut in a day has been broken by some one of the sawmills of the coast redwoods. So much lumber is still produced by rival mill men that it has not paid for cutting, and some of the large California firms of lumbermen have become bankrupt. Enormous trees that represent from 800 to 1,000 years of symmetrical growth have been sawed up with no profit, or with actual loss, when, if they had been left to stand a few decades longer, the profit might have been a thousand dollars an acre.

At the time of the American occupation of California the forests covered, perhaps, 50,000 square miles. Half of this has been cut over or is inaccessible or consists of species of less value than those which have heretofore been cut. It is often asserted that California still has twenty millions of magnificent forest land, but the truth is that there is left hardly fifteen million acres, and much of this has been cut away.—*Scientifie American.*

The Water Trees of Australia.

Those who go out to grapple with the dangers, the hardships, and the mysteries of the Australian desert regions should, above all things, instruct themselves in bush lore. It has happened more than once that in these dread torrid wastes the body has been found, lying beneath a tree, of some poor wanderer who had died from the lack of water, even while there was within a few inches of him a plentiful supply.

In all the unwatered regions of Australia are to be found "water trees" trees which actually provide a supply of water to those who know where and how to look for it. The most reliable of the water trees are the water mallars, or group of trees, including the *Eucalyptus microtheca*, which form a part of the terrible maller scrub. Outside of these, the currajong, the desert oak, the bloodwood, and several varieties of the acacia are water bearing trees.

I shall not soon forget my first introduction to a water tree. I was in the northern territory of South Australia, and I was making my first journey through the desert in company with a friend who was a well-informed bushman. It was toward the end of the day, and as he had been detained for several hours owing to an accident, we had still fifteen miles to travel. The water bag had been drained hours before, and in that dreadful desert our sufferings had already become intolerable. Suddenly my friend plunged his spurs into his weary horse and dashed at full gallop toward a tree some fifty yards off shouting to me to follow. Flinging himself from his saddle, he clawed with his fingers the sand at the base of the tree, and presently laid bare one of its spreading roots. This was torn from the earth to the length of about six feet, and breaking off a piece about a foot and a half long, my companion signing me to follow his example, applied one end of the piece of root to his parched lips and elevated the other end. I followed suit, and to my indescribable joy a cool refreshing draught of water rewarded me. The one root amply suf-

ficed for our wants. There was some ten or eleven left, enough to have satisfied a dozen thirsty men. Some of the water we drained into our water bags. It was clear and cool, but after standing for a few hours I noticed that it became discolored.—*Introduction.*

A Giant of Former Ages.

It is well known that everything on this earth is judged relatively. It is difficult to believe that turtles were once as large as elephants and that crocodiles walked on their hind legs and were 65 feet tall, although there are still turtles that are one and one-half yards long and crocodiles 22 feet long; and we are even more surprised to learn that certain dragon flies that lived in former ages measured 27 inches from tip to tip of the wings, because those of the present day are scarcely one-tenth as large. However, such insects did exist when the coal was still green and soft, and the explorer Charles Brongniart has described fossils of them found in the mines of Commentry in the Department of Allier, France. These, of course, were not exactly like the dragon flies of the present day, but were similar to them. Brongniart has called them *protodonta* and those of our time are named *odonta.* He has found such fine specimens that the whole insect has been reconstructed.

Brongniart has found specimens of two different species, the large one already referred to, which he has named *Meganeura monyi,* for Mr. Mony, director general of the mine at Commentry, and one only about half as large, which he called *selysii,* for the Baron Selys Longchamps, of Luttich, the best authority on living draggon flies in Europe. The *Meganeura monyi* had a thick head, and colossally developed jaws that were provided with strong teeth; the eyes, like those of the present species, were large and round; the first of the three rings, the prothorax, was narrow, but the second and third rings, the mesothorax and metathorax, to which the two sets of wings were attached, were more fully developed; the legs were powerful and quite long, the hind legs being longer than the two other pairs; and the wings were very long,, almost five times as long as wide.

It would seem that the dragon flies of ancient times did not differ materially from those known to us, but being so much larger and voracious, we can assume that the insects and fish which served as food for them, both in the larval state, under water, and as flies, must have been either very large or very numerons.—*Illustrirte Zeitung.*

Engineering Tools at Pompeii.

Under the title of "Things of Engineering Interest Found at Pompeii," Professor Goodman lately gave his inaugural lecture in the engineering department of the Yorkshire College, Leeds. The lecturer remarked that he had recently visited Pompeii, and was not only charmed by the great beauty of the works of the ancient Romans, but also by their extreme ingenuity as mechanics—in fact, it was a marvel how some of the instruments and tools they were in the habit of using could possibly have been made without such machinery as we now possess.

After explaning the situation and destruction of Pompeii by showers of ashes and mud, not lava, as is usually supposed, in the year 79 A. D., Professor Goodman showed a series of about fifty lantern slides, prepared from photographs taken by himself in Pompeii last Easter. The streets, he explained, were used as waterways to carry off the surface water, and probably sewage, from the houses. The pavements were raised about four feet above the streets, and stepping stones were provided at intervals for foot passengers.

The horses and chariot wheels had to pass between, and in many places deep ruts have been worn by the chariot wheels in the stone paved streets. The water supply of Pompeii was distributed by means of lead pipes laid under the streets. There were many public drinking fountains, and most of the larger houses were provided with fountains, many of most beautiful designs. The amphitheater, although a fine structure, capable of seating 15,500 people, was small compared with many in Italy. The bronzes found at Pempeii reveal great skill and artistic talent. The bronze brazier and kitchener were provided with boilers at the side and taps for running off the hot water. Ewers and urns have been discovered with internal tubes and furnaces precisely similar to the arrangement now used in modern steam boilers. Several very strong metal safes, provided with substantial locks, have been found. The locks and keys were most ingenious, and some very complex. On looking at the iron tools found in Pompeii, one could almost imagine he was gazing into a modern tool shop, except for the fact that the ancient representatives have suffered severly from rust.

Sickles, bilhooks, rakes, forks, axes, spades, blacksmith's tongs, hammers, soldering irons, planes, shovels, etc., are remarkably like those used today; but certainly the most marvelous instruments found are the surgical instruments, beautifully executed, and of design exactly similar to some recently patented and reinvented. Incredible as it may appear, yet it is a fact, that the Pompeiians had wire ropes of perfect construction.—*Scientific American.*

The Discovery of Argon.

Lord Rayleigh and Prof. Wm. Ramsay called at the United States Embassy, in London recently, when Mr. James R. Roosevelt, first secretary handed to them a check for $10,000, which had been granted by the Smithsonian Institution, at Washington, as the first Hodgkins prize, for their memorandum on "Argon, a new constituency of the atmosphere," embodying a most important discovery in connection with atmospheric air.

Angling by Electric Light.

One evening recently two anglers, one a resident of Newhaven, tried the interesting experiment of fishing in Seaford Bay by electric light. A fisherman of Newhaven rowed the anglers from the railway pier soon after six o'clock, when it was completely dark. A portable battery with a 5 candle power incandescent lamp was taken, and this lamp was lowered until a weight below it touched the bottom at 25 feet. Both battery and lamp were specially made for the trial, and the lamp was protected by a galvanized crinoline and was made watertight. When it reached the bottom of the sea, there was, it is stated, a circular area, 20 yards in diameter, brightly illuminated right up to the surface. Fishing was carried on with an ordinary line on the port side, the lamp having been lowered on the starboard side of the boat.—*Scientific Ameaican.*

PENIKESE—A Reminiscence.

By One of its Pupils.

Copyright secured 1895.

"Now in regard to protective coloring. What is it if not the way in which some animals are enabled to secure their prey and to guard themselves from their enemies. Look at an instance which I myself noted! A troup of small fishes were quietly swimming over some eel-grass when, suddenly, they took fright and suched off in a different direction; then, seeing before them a bright, tin peach can, which had been thrown into the water, they separated and instantly darted off in every direction. Now what bothered me for a long time was the cause of their fright at the eel-grass,—and it was a long time before I discovered it. By accustoming my eyes to the water, and studying it intently for some time, I found, buried snugly in the grass and of just the same color, the form of an ugly old sculpin, who, as the fishes came over him, had gulped down some half a dozen of them to make a meal of. The sudden disappearance of so many of their comrads at once, was enough to terrify the ranks of any company. Of course they did not see their enemy until he had made victims of some of their number. Then the poor, innocent tin can must be instantly avoided for its glaring colors. If that is not an instance of protective coloring, what is?

"Then, too, the practical importance of the 'survival of the fittest' can be illustrated in this way: Suppose that there was but one cod fish in the word, and that it produced 9,000,000 eggs. All lived, and each adult fish produced 9,000,000 more eggs. As a result of this increase, the world would soon be buried a thousand feet deep in cod fish. (Applause). But, as it is, they are being continually thinned out; only about one-half of the eggs laid are impregnated, scarcely one-half of these survive impregnation—one-half of this half are killed when very young by frogs and other fishes, and, during their whole growth, they are being continually lessened. Even when fishes (fishes of other species, I mean,) go down the rivers to the ocean," (the professor, doubtless, refers to salmon, shad, and other *river* fish,) there stands a great barrier of enemies through which all must pass; and think what few survive! No wonder that those are the sharpest, keenest, strongest, and best fitted to allude their enemies. The remark made concerning shells and their seduction in species, will also apply to fishes and other branches of the animal kingdom; and, contrary to what is stated by the non-evolutionists that the greater the amount of material we get the better we are able to separate species, I say—that by this we are the better able to condense species.

"De Caudole accepted, at first, the complete yet complex classification of the oaks, as given by eminent botanists; yet even he admits that, given the same climate, temperatures, soil, and other circumstances which affect their growth, many species converge and finally meet.

"The divergence of species is going on all over the world, and what we want to do is to unite them as much as possible, and find out the truth in regard to them. If anybody can prove the theory of Mr. Darwin false by true facts, we are all ready to believe him."

The professor then spoke of the races and ages of man in the world, since its beginning, and instanced them as proof of the theory which he supported, namely, the "survival of the fittest." He next made a statement, which is the strong point of the whole theory, that: "Even if we look at it in a religious point of view, what is more beautiful than to imagine us, in centuries and centuries of time, gradually growing better and better, stronger and stronger and more perfect, until, by the gradual growth and survival of the fittest, the best we have ultimately reaches full perfection. I think that the theory of evolution is the only one that will explain the peculiarities of our living organisms."

During the latter part of the session of the school, and after Professor Morse's lectures upon evolution, we had a few words upon the subject, though in a different direction, from Professor Putnam. Mr. Putnam is as value and sound a reasoning non-evolutionist as is Mr. Morse an ardent and theorizing evolutionist. I well remember how, one day, the former stopped suddenly in a lecture upon fishes—the *myxine* being the subject of his talk—and after looking at us for a few moments with one of his tired yet kindly smiles, said:—

"As this is my last lecture, and as so much has been said already concerning the theory of evolution, and that in its favor, I think it but fair that a few things should be said to you upon the other side, and I propose, this morning, to give you a few facts that have led me to place myself on that side:—

"Of the three lowest branches of the vortebrate kingdom, we have represented the laucets, the myxine, and the lampreys. Now! if the theory of evolution is correct, we would naturally expect to find these three groups differing only in such a way that one is the higher power of the other; but, what *do* we find? In the lampreys, the highest of the three classes, we find the eggs forming in the oviduct, and falling free into the abdominal cavity. In this little myxine, besides other peculiarities, there are *no* oviducts."

Here the professor explained in full the formation of the egg, and the other peculiarities of its growth, etc., and said: "Thus we have an animal next higher than the amphioxus, (the lowest form amongst the vertebrates, and cited by many as the connecting-link between back-bone and non-back-bone life,) giving characteristics similar to those of the higher groups of selachians and even some of the higher orders of animals themselves, though, in general development, far inferior to the lampreys even, which are higher in so many respects. Now this is only *one* instance of *the distinctive character of individuals.* The evolutionists would probably say, that this simply formed a branch which refused to unite; but, to my mind, that hardly accounts for the fact: It hardly seems possible that there should be found so many branches, as there really are, refusing to unite."

Here, Professor Putnam's remarks were cut short by some call in another direction, and he left the island before completing the talk which he had promised us, and had, so far, so ably and so significantly begun.

It is, without any doubt, such facts as these: species of a known and definitely lower group possessing so many of the characteristics of the higher animals, that cause the *working* naturalists to rebel against the ardor of his more sanguine brother scientist, who first pronounces his theory, and then endeavors to fit to it or explain away from it the facts that come within his reach. Without doubt Agassiz saw far enough into Nature's realities to avoid theories and useless controversies. *He* endeavored to let his investigations refute theories based upon false premises.

Professor Morse, when he said that anti-evolutionists were, "with a few exceptions, merely species describers," forgot the tremendous concession thereby

(*To be continued.*)

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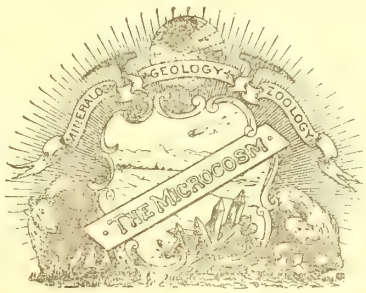

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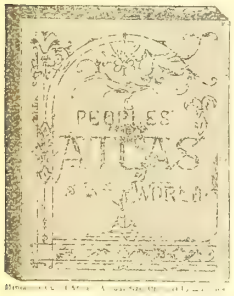

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Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
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13.	" " maculata, 1 to 2½ inch	6
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18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch. single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
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29	Melongena subcoronata, 2 to 6 inch	8
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32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
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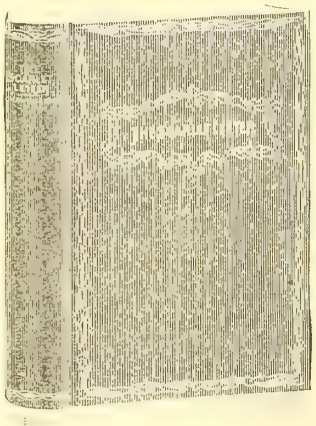

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Tree Ages.

Gericke, the great German forester, writes that the greatest ages to which trees in Germany are positively known to have lived are from 500 to 570 years. For instance the pine in Bohemia and the pine in Norway and Sweden have lived to the latter age. Next comes the silver fir, which in the Bohemian forests has stood and thrived for upward of 400 years. In Bavaria the larch has reached the age of 275 years. Of foliage trees, the oak appears to have survived the longest. The best example is the evergreen oak at Aschoffenburg, which reached the age of 410 years. Other oaks in Germany have lived to be from 315 to 320 years old. At Aschoffenburg the red beech has lived to the age of 245 years, and at other points to the age of 225 years. Of other trees, the highest known are ash 170 years, birch 160 to 200 years, aspen 220 years, mountain maple 225 years, elm 130 years and red alder 145 years.

The Lava of Idaho.

Ages ago a vast river of fire poured down the center of the State of Idaho. This river consisted of molten lava, was 400 miles long, 100 miles wide, and from 300 to 900 feet thick. Across the corpse of this mighty river of fire a river of water has slowly cut a channel in several places. Born in the melting snow of the majestic Tetons, this river has cut its way for hundreds of miles through lava beds, in its course tumbling over numerous precipices until the great climax is reached at Shoshone Falls, where this mighty river makes an awful leap of 210 feet, a magnificent spectacle, in marked contrast to the desolate country on either side.

Plants of the Alpine Region.

The peculiar forms assumed by plants of the Alpine region, offering excellent material for truly geographical study, are described entertainingly by G. Bonnier (Les plantes de la region alpine, et leurs rapports avec le climat. Ann. de geogr., Paris, iv. 1895, 393—413). The plants are dwarfed, the stalks are low, the leaves are close to the ground in rosettes or tufts, the roots are large in proportion to the stalks and leaves: new individuals are often propogated from runners, so that the ripening of seeds need not be depended on. Growth begins before the snow of winter entirely disappears, and during the short summer advance is made rapidly to maturity; different phases of growth being abbreviated and their succession accelerated. While accounts of these peculiar features are used to intensify the appreciation of the average temperature of the Alpine region, of the long-continued presence of its snow cover and of the brevity of its open summer, they properly belong under geography; but when they are followed by experiments on plants of the same species grown at high and low levels, and on minute observations of modifications of structure at high levels, the subject assumes a decidedly botanical flavor. Botanists as well as geographers will therefore find interesting matter in Bonnier's account of his gardens in the Alps and the Pyrenees, where for some years past he has cultivated plants taken from lower lands. The figures illustrating the difference between plants grown from two parts of a single rootstock, one in the Alps, the other in the lowlands, are particularly instructive from the remarkable modifications of the normal form produced by the Alpine habitat.—*M. W. Davis in Science.*

The Brachiopods.

Like the crinoids, the Brachiopods of today are but the remnant of what was once (notably in the Silurian age) a vast family.

Cosmopolitan in the extreme, they once swarmed in the waters of both hemispheres, nearly 2,000 fossil species having been discovered. While many families have entirely disappeared, still, in *Ferefratulina* and *Lingula* we have representatives of the two great subdivisions or orders of this class. *First* those with hinged and toothed shells and *second* those with valves of shell entirely separate and not toothed.

Now, before we go any further, what is a *Brachiopod?* You pick up one of the common fossil species of *Spirifer Orthis* or *Arthyris*, found in the quarries; especially at Penn Yan, N. Y. and certain localities in Ohio and Indiana; and say, "Look at the shell turned into stone!" and then probably ninety-nine people out of every one hundred would connect it in their minds with the common clam and similar bivalves. But SCIENCE will not agree with you here. Careful investigation on living specimens of modern forms has shown a closer affinity with the common earth worm than with our true shells or MOLLUSCS. Therefore they have been placed in the fifth branch of the animal kingdom, *Vermes* or worms. Worms with a shell, truly they would seem entitled to a place of their own, between the worms and true molluscs. However, for that matter there are molluscs (notably the *Octopus*) which have no shell, and for convenience, if nothing else, we *must* draw the line somewhere. So we leave our Brachiopod where we found him—viz:—A highly specialized type of worm living in a shell.

The first order of this class—i.e. —those with hinged shells, has given us the greater number of species. In most cases the shells are inequivalve—one valve being larger than the other. The commonest species with us is *Terebratulina septentrionalis*, which means "Little borer of the north." It is found commonly from Cape Cod to the Bay of Fundy. The base of the larger valve is perforated for the passage of the peduncle or "stem" by which they fasten them-

selves to the rocks. This order comprises the families *Spirifer*, *Athyris*, *Atrypa*, *Orthis*, and others, most of which we know only by fossil forms. Judging from the numbers found in favorable localities, they must have existed in almost incredible numbers during the Devonian age.

The second is almost exclusively represented by the family *Lingula* now. This order was never very prolific in species though it antedates the other and, in fact, is perhaps the oldest form of organic life. They are, with the *fucoids*, the predominating feature of the Medina Sandstone group of western New York. The valves of the shell are not fastened together at the base and consequently became easily separated, which accounts for the rarity of complete pairs among the fossil remains. The common form of our coast, *Lingula pyramidata* can be found living in burrows, from North Carolina southward. The representatives of this branch of the animal kingdom have undergone surprisingly little change since the earliest times, the modern forms being quite similar, as far as can be determined, to the fossil species. Sometime we will look up another almost extinct order, the *Crinoids*.

ERNEST H. SHORT.

African Volcanoes.

In 1891, when Emin Pasha started west from Victoria Nyanza on the journey that ended in his violent death, he and his comrade, Dr. Stuhlmann, were the first white men to see the big mountain Mfombiro, 120 miles from the lake which Capt. Speke, many years before, had placed on his map on native information. They found that Mfumbiro was not an isolate cone, but the most eastern of the hitherto unknown range of volcanoic origin. Their first purpose was to determine the outlines of Lake Albert Edward, and they did not stop to explode these mountains; but Dr. Stublmann sent home an interesting report of the natives that Virunga, the most western summit of the chain, was a fire mountain, from whose top smoke was often seen to issue, and from which noises were heard like the bellowing of cattle.

On December 8 a cablegram reached Europe from Count von Gotzen, the German Explorer, announcing his arrival on the lower Congo, after crossing Africa from east to west. About the same time a letter he had written in central Africa in June last arrived. It contained brief but interesting details of his visit to Mount Virunga. There have been reports of plutonic activity among the Rif Mountains, in northwestern Morocco, but the hostile natives have prevented investigation. The subterranean forces that formed the great trough and piled up mountains of lava and ashes east of the great lakes show, by solfataros, hot springs, and other phenomena, that they are not yet entirely spent. But until the discovery of Mount Virunga no active volcano was known to exist in Africa.

While still far away Count von Gotzen saw a thin column of smoke ascending from the principal crater, and later he found that the rim of this orifice is 11,400 feet above the sea. The volcano, therefore, is not a snow mountain, and is not so tall as its nearest neighbor on the east, which, according to Stuhlmann, is about 13,000 feet high. It took von Gotzen several days to force a passage through the dense forest and to scale the steep mountain side. At last he stood upon the edge of the crater and looking down upon a most interesting spectacle.

The crater is about a mile in diameter, and the top of the encircling wall, on which the explorer stood, is about 160 feet above the crater floor. The inner side of the wall was too steep for comfortable descent, and in view of what was going on at the bottom, there was absolutely no temptation to make the journey.

The yellow-hued bottom of the crater floor was as smooth as the surface of a lake, and the explorer believes he was looking down upon an expanse of molten lava. Above this smooth surface rose the walls of two orifices, as regularly formed as though they had been made of masonary. From the more northern of the two orifices, which was over 300 feet in diameter, a small volume of smoke was issuing, accompanied by a noise that sounded like the roll of distant thunder. There were unmistakable indications that outside of this crater another center of eruption exists on the west side of the mountain, but the explorer was unable to push through the woods to reach it.

For some years a little lake has appeared on the maps some distance south of the place this volcano has been found to occupy. It is Lake Kivu, seen by no white man until Von Gotzen stood on its shores soon after he had looked down into the smoking crater. He says the lake stretched away before him like a sea, and though it was a clear day, he could not see its southern shores. He believes the lake is almost as large as Lake Albert Edward. Its outlet is supposed to be the Rusisi River, which enters the north end of Lake Tanganyika.

It is too early to regard the large prizes of African discovery as all won when such interesting and important results reward research as those attained by the latest traveler across Africa.—*N. Y. Sun.*

The Plymouth Meteorite.

BY HENRY A. WARD.

The Plymouth meteorite was found in the year 1893 by Mr. John Jefferson Kyser, while plowing in a field on his farm, about five miles southwest of the town of Plymouth, Marshall Co., Ind. Mr. Kyser had about the year 1872, found in the same field another, larger mass of the same iron. This mass was pear-shaped, about four feet in length by three feet in its widest diameter, narrowing to six or eight inches at its upper end. It lay for a year or two so near the surface of the ground as to be seriously annoying in plowing the field. On that account Mr. Kysey, aided by his son, dug a deep hole by the side of the mass and buried it to the depth of one and one-half to two feet beneath the surface where it should thenceforth do no more damage.

The account of this I had last June from the son, Mr. John M. Kyser, now city clerk of Plymouth. Mr. Kyser well remembers the circumstance of the finding of a large piece and assisting his father in burying the same; and he further thought that, notwithstanding the removal of certain landmarks (a fence and tree) in the field, he would still be able to locate it very closely. This he subsequently undertook to do by trenching, but was unsuccessful in finding the mass. I was myself present and assisted in a further search for it in September last, using a surveyor's magnetic needle, with the hopes of the same being attracted to the mass and discovering it, but all to no purpose. Mr. Kyser seems to feel very confident of his

knowledge of the immediate vicinity of the mass where he buried it 22 years ago, but is unable to prove its presence by rediscovery. Nor has he the aid of another eye-witness, his father having died soon after the original finding and burying as above mentioned.

The smaller piece, which was, as before said, found in 1883, was presented by Mr. Kyser, Sr., to Mr. W. S. Adams, who, at that time, kept a plow factory in the city of Plymouth. It was retained in their family until last November, when it was brought to Ward's Natural Science establishment in Rochester, N. Y., by Mrs. Adams, from whom I procured it.

The mass is a lengthened, tongue-like form, not unlike a rude mound builder's ax. Its greatest length is 12½ inches, its width 7⅜ inches, its thickness in the middle about two inches, from which, in the greater part of its length, it slopes in a somewhat even manner to a thin rounded edge.

Its surface is deeply eroded by oxidation, so that, although sound and free from scales, it shows no signs of an original crust. The characteristic pittings of meteorites are also by the same cause rendered somewhat feeble, although still clearly visible. We have cut a number of thin slices from the mass. These etched in dilute nitric acid give very clear Widmanstatten figures. There are, further, several small nodules of troilite.

A careful analysis of this iron has been very kindly made for me by Mr. J. M. Davison, of the Reynolds Labratory of the University of Rochester, and I give the same below.

ANALYSIS OF PLYMOUTH METEORITE.

Fe	88·67
Ni	8·55
Co	0·66
Cu	0·24
P	1·25
Graphite	0·11
S	0·07
	99·55

This iron, herein briefly noticed, is interesting in many ways, and it is much to be regretted that the large mass, of which the record seems to me to be entirely reliable, cannot be rediscovered.—*Amer. Jour.*

HAIR UNDER THE MICROSCOPE.

One of the Many Important Factors In Murder Cases.

In centuries past the human hair played an important part in all judicial proceedings. Those that were permitted to wear beard and hair had rights which could not be claimed by the shorn and shaved. When men made oath, they touched their beard and hair, and women placed the finger tips of the right hand on their tresses.

Servants were obliged to have their hair cut, and if a freedman went into slavery he had to divest himself of his hirsute adornments. An adult adopted by foster parents was obliged to have his beard shaved and the shaving of beard and hair was a punishment inflicted on criminals. The jurisprudence of our ancestors dealt with punishment "by skin and hair" for small offenses and "by neck and hand" for greater crimes.

There has always been more or less superstition about hair. Great strength was implied by it, and wizards and witches knew of concoctions of hair by which they poisoned enemies. Cats' hair was especially named in the category of poisonous hairs, and even at the beginning of the seventeenth century Paulus Zacchias, a famous physician, writes of the virulent poison of the hair of cats.

Among civilized people such superstitious beliefs have gone out of existence, and only Malays give their enemies tiger hairs in broth to kill them.

Hair today, however, is one of the important factors in deciding murder cases, and the microscopic examination of hair, where it is found in criminal cases under suspicious circumstances, is invariable.

The first thing the coroner is called upon to determine is whether the hair is from man or beast. The microscope determines this beyond peradventure. Animal hair differs in construction from that grown on a human head. In human hair the upper skin is smooth and thin. The circular section is comparatively broad, forming the main part of the hair shaft. It is striped in appearance and carries the color matter. The tubular part is thin, extending to about one-fifth and certainly not more than to one-quarter of the entire width of the hair.

Animal hair also consists of three parts, but these are differently constructed, the tube often filling the entire hair. The ends of the hair must be closely watched, and especially woman's hair will be found ragged and torn at the ends.

The hair from beards is usually the thickest, its diameter being as much as 0.15 millimeters, while hair from female heads can be as fine as a diameter of 0.06 millimeters would make it.—St. Louis Republic.

The Most Curious Known Animal.

The most peculiar and remarkable animal in the world is the Ornithorynchus paradoxus, the famed egg laying mammal of Australia. It is shaped like an otter, has fur like a beaver, is web footed like a swan, has a bill like a duck and a tail like that of a fox. It is the only known fur covered creature that lays eggs. A corresponding oddity among feathered bipeds would be a bird that brought forth its young alive.—St. Louis Republic.

How a Tree Grows

If you wish to become thoroughly acquainted with the tree's mode of growth the first thing of importance is to keep in view the function of the "cambian layer"—the soft, spongy substance lying between the wood proper and the bark. The pulpy, porous substance is really a tissue of minute cells, visible only under the microscope, and apparently all of the same size and shape in any given variety of tree. The cells lying nearest the bark contribute a permanent accretion to the tree's covering, while those which lie nearest the wood slowly change from "cambian layer" to real tree fiber. In this way the bark becomes thicker each year, and at the same time the tree itself is permanently enlarged.

In the spring and early summer the bark on all trees is to a certain extent loosened to permit of the cambian layer exercising its functions, and when this wholly ceases the result is manifest in the "ring" of new wood and the thin layer of newly formed inner bark. The ends of each limb have also grown perceptibly—from two inches to two feet, according to the species—but knots, marks, forks, etc., on tree trunks are no higher from the ground than they were the year before. If some one tells you that a limb which is now but three or four feet from the ground "will be high enough to walk under when the tree gets its growth," put him or her down as a person knowing but little about the natural history of trees.—St. Louis Republic.

Ore Deposits.

Ingenious theories have from time to time been advanced by scientists relating to ore deposits—the cause, time, manner, etc.—and among the most recent and able of these Professor Le Conte may well be ranked. His conclusion is that such deposits, using the term in its widest sense, may take place from many kinds of waters, but especially from alkaline solutions, these being the natural solvents of metallic sulphides, and the latter are usually the original form of such deposits. They may take place from waters at any temperature and pressure, but mainly from those at high temperature and under heavy pressure, because, on account of their great solvent power, such waters are heavily freighted with metals, and the depositing waters may be moving in any direction—that is, may be up coming, horizontally moving, or even sometimes down going, but mainly up coming, because, by losing heat and pressure at every step, such waters are sure to deposit abundantly. Furthermore, Professor Le Conte says that deposits may take place in any kind of waterways, such as open fissures, incipient fissures, joints, cracks and even in porous sandstone, but especially in large open fissures, the latter being the main highways of ascending waters from the greatest depths. Deposits may also be found in many regions and in many kinds of rocks, but mainly in mountain regions and igneous rocks.

PENIKESE—A Reminiscence.

By One of its Pupils.

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made to those same "non-evolutionists," since one of the evolutionist's grand theorems is, that "no one has as yet even defined what a species is." The non-evolutionists do *not* seek to make species, genus, family, orders, branch, and such like divisions of the animal kingdom synonymous with the term individual, as do the evolutionists, though they, the former, *do* believe in the universal oneness—if we may so call it—of matter, as well as in its indistructibility.

As, at length, I draw near to the conclusion of my task—a most delightful and pleasant task, I admit—of sketching, for my readers' benefit, the history of Penikese Island; what crowds of memories press around and upon me: Memories that I have written about and memories that I have not written about, but which yet hover around and about places hallowed by the mysterious ever present presence of him whose memory is dear to so many. As I draw near to the conclusion of my task; I fear both what I have written and what I have not written. What I have written, that it ought not to have been written, and what I have not written that it ought to have been written. Yet, such as it, it must stand. My object has been *not* to transcribe to you a dull, dry, monotonous diary of facts—difficult to digest,—but rather, by a taste of our pleasures and enjoyments, to leave the mind of the reader in a state of anticipation and desire to explore Nature and the mysteries of Nature; for, thereby, is gained profit, delight, wonderment, satisfaction, and everything that is in harmony with our being and our eternal welfare. We come nearer to our fellowman and closer to our God, in a study of all creation and of created objects; and so, at least thus I believe, do we fulfill better our mission here upon the earth, to "know even as we are known."

During the session of the school the Agassiz Natural History Club met weekly for discussion of scientific subjects, and for suggestions as to the work going forward and to be pursued. Here teacher and pupil met upon equal footing and freely discussed all questions. Even practical Professor Meyer became eminently scientific and, at a suggestion, turned his physics to the settling of many an otherwise abstruce problem. Of one in particular, namely, that of testing, by actual experiment, if insects could hear with their antennae—that delicate organ of the functions of which we know so little. He so arranged a male mosquito, upon one of the slides of his lantern, that he threw its image, enlarged several thousand times, upon a large white sheet. Then he vibrated tuning forks near to them, and, by noting the antennae of the insect, we were enabled both to propound and to answer questions that would otherwise have puzzled the ablest scientists.

Thus passed our days! The last, as prolific of interest as the first. Alas! They no longer exist, save in the memory of teacher and of pupil.

But a few words more, and the gleam of my candle, growing fainter and fainter, leaves darkness once again. Darkness, I say; yes, darkness—save for the memory of that gleam: A. Recollectron.

The Agassiz Society of Natural History met, for the last time, in the lecture room, Monday evening, August 31st.

Its business was simply "to consider the resolution drawn up by the committee," appointed for this purpose at a previous meeting, "on the death of Professor Louis Agassiz." It was accepted by the club, "as an expression from the club, of their sympathy with the friends of, and their love and respect for, the professor taken from among them so suddenly." The resolution was as follows:—

"Whereas, it has been decided that we, the members of the Agassiz Natural History Club, attempt an expression, in resolution, of our feelings upon the departure of our beloved leader, and our sympathy in this great bereavement with the many who have learned to speak his name in the accents of tenderness and affection, therefore, it is

"Resolved, That in the close of the grand life of Professor Louis Agassiz we mourn the loss of a good citizen, an earnest student, a great teacher, a faithful friend, a true Christian. a lover of his fellowmen and of God; that, though words utterly fail to express the estimation in which we hold his noble example and teachings, we may yet show to the world our appreciation of the light that is gone in our works and lives, and that from the bottoms of our hearts we do sympathize with all to whom his memory is dear."

On the 14th of December, 1878, in the sixty-sixth year of his age, Professor Agassiz passed away.

A boulder from his beloved Alps alone marks his resting-place at Auburn, city of the dead:—while lilies bloom about him (white lilies-of-the-valley, are they too); the birds and insects make music above him; and, while the world endures, his memory shall never fade.

The story is completed by the recent notice of the complete destruction, by fire, of the school buildings, which can now be viewed by picture only. Alas, indeed! Penikese Island is now only a memory!

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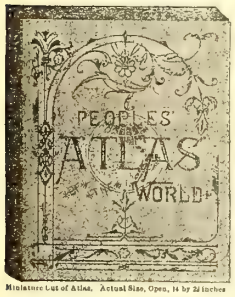

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NATURAL SCIENCE NEWS

VOL. I. No. 50. ALBION, N. Y., JANUARY 11, 1896. Weekly, $1.00 a Year

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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18	Murex pomum, 1 to 3 inch	3
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29	Melongena subcoronata, 2 to 6 inch	8
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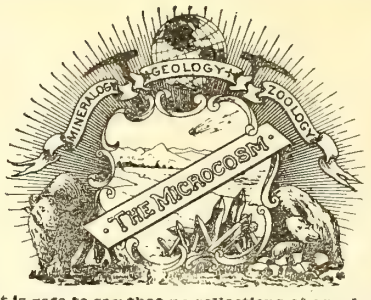

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Natural Science News.

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Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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Hair Worms and Their Hosts.

At Betchworth, Surrey, just where the road crosses the River Mole I picked up a specimen of *Pterotichus madidus*, Fab., from which, upon being placed in the cyanide bottle, a *Gordius aquaticus*, L., endeavored to escape. About three inches of it extrude, and judging by its girth, an equal or greater length remains inside, yet the abdomen of the beetle is but nine milimeters in length.

Nearly every observer of the slighest experience has some acquaintance with hair worms, even if it is only a hazy recollection of the horse hair legend of his school days. Numerous notes are scattered through the early volumes of *Science Gossip* and a further one upon the variety of the hosts *Gordius* infests may not be unacceptable. The family *Nematoidæ*, to which the *Gordiaceæ* belong, contains many species of more than ordinary interest, first on account of their curious cycle of development, and then their value in the economy of nature, for not only are they in a measure beneficial in checking over-production in certain insects, but more or less dangerous when introduced into the human system. Their life history may be briefly described as follows: The eggs are laid in long strings; upon hatching, the young larva bores through the membrane, and for a short period lives a free aquatic life. It then becomes parasitic upon various fly larvæ, etc.; these hosts in their turn are devoured by other creatures, and the worms become incepted in their intestines, where they remain some months finally making their way into the intestinal cavity and escaping per ano in due course.

It is rather singular, however, that, whereas hair worms are most commonly found infesting beetles in England, they prefer the orthoptera (grasshoppers and allied insects) in America. In both countries spiders have been noted as hosts, in America the human being, and an instance has come under my own notice where there was strong presumptive evidence the worm had been voided by a sparrow. Various writers cite fishes and frogs and several mention caterpillars, but the parasites observed in lepidopterous larvæ probably belonged to the allied genus *Mermis*. In America, *Mermis acuminatai* Leidy, has been observed in the larvæ of the codlin moth (*Carpocapsa pomonella*, L.) and a similar parasite has been seen in larvæ by several of our London workers.

In enumerating the hosts of *Gordius acquaticus*, the common European hair worm, several difficulties arise, for whereas, as I have already mentioned, carnivorous beetles are chiefly infested this side of the Atlantic, the observers do not always seem to have determined their species. Several references of this sort will be found in *Science Gossip* (vol. i. page 198, vol. xii, page 71, vol. xv., page 281, etc.) If any of our present readers can furnish something more definite, we shall be able to get along with our list. I have come across no mention of coleoptera being infested in America, in any note to which I have access; but the following are some of the authenticated instances among the orthoptera:

G. aquaticus has been found in the cricket (*Gryllus neglectus*) and in *Acheta abbreviatus*, Serville—the short winged field cricket found in woods beneath logs and stones; *Gordius robustus*, Leidy, infests *Stenopelmata fasciata*, Thomas, one of the stone or camel crickets usually found beneath stones and along the margins of woodland streams and logs, and in damp woods (Blatchley), and *Orchelimum gracile* a grasshopper confined to low moist meadows; has been taken from a pupa of *Xiphidium ensiferum*, Scudder, whose perfect body measures but half an inch in length. The life history of this orthopteron is of exceptional interest, the ova being deposited from several up to 170 "in the turnip-shaped galls produced by a small fly belonging to the *Cecidomyidæ* on certain species of willow (*Salix cordata*, etc.)"

I have now but to mention *Caloptenus spretus*, Thomas, the Rocky Mountain locust, which is infested with *G. aquaticus*, Linn., and *G. varius*, Leidy, although repeated dissections by various American observers (Riley, Whitman, etc.) have shown that not more than a a small percentage of the locusts are infested, yet when we consider the loss incurred annually in the United States from locusts alone is estimated at £8,000,000, anything which tends to mitigate the plague becomes of importance.

The question, how are we to account for the presence of these aquatic parasites inside terrestrial insects? upon consideration, is not of easy solution. Of course they are introduced with their food while in a minute immature state, but whether as ova or larvæ I think there is room for discussion. It will be noticed all the insects mentioned are associated with damp places that are more or less subjected to floods; but I don't think that sufficient reason for believing they have all fed upon the various aquatic fly larvæ in which the hair worm larvæ are said to pass their first period of larval life, though in the case of grasshoppers Packard thinks they swallow them as larvæ. I am inclined to believe there are several points in the life history of these parasites yet to be cleared up; perhaps some of our microscopists can eludicate them.—*Harry Moore in Science Gossip.*

Exploring the Colorado River.

The San Fransico Call says: 2d Lieut. F. M. Davis, 4th Cavalry, who accompanied 1st Lieut. C. L. Potter, of the Engineers, in his expedition down the Colorado River, is busily engaged in his official report of the undertaking. Although the report is primarily prepared for official eyes, it will be no ordinary compilation of technical information and forbidding statistics. On the contrary, the report will record one of the most thrilling experiences which human beings ever survived. Speaking of their adventures, Lieut. Davis said

recently: "Some time near the 1st of October Lieut. Potter received orders to proceed to investigate the possibilities of the Colorado River for navigation purposes, from the mouth of the Virgin River to Yuma. The understanding was that he was to proceed to the Needles and from there he towed up the river, a distance of 250 miles, by Indians."

The adventures of the party, as described in the Call, were very thrilling. As Indian boatmen refused to brave the cruel rapids of the treacherous river, two old trappers were hired, who, for $5 a day were willing to undertake the risk. They were experienced water-men and cool headed. They had bow and stern lines, each 200 feet long, and at one point had to send the men up on cliffs 100 feet high, from which, by the aid of lines, they would "snub"the boat around the ledges of the canyon walls. In one day, within six and one-half miles, they shot fifteen dangerous rapids, Before them seemed almost certain destruction, and to turn back was impossible. The further they went the deeper and blacker became the canyon. Concerning rapid No. 26, Lieut. Smith says:

"Here on both sides towered the steep black walls, 1,000 feet high. Between these walls for a mile there was nothing but angry, hissing foam. We examined first one side and then the other for ledges along which we might climb and draw the boat. It was useless and to attempt to run that frightful place would have been madness. It was at this point that Major Powell's men abandoned him. We searched for the trail by which they escaped from the prison-like inclosure, but in vain. In our explorations I had sprained my ankle and we were compelled to lie over a couple of days until I could walk. In the meantime Lieut. Potter investigated several branch canyons in the hope ot finding a means of egress. On the Arizona side he followed a canyon for eight miles, to where it abruptly ended in a perpendicular wall 4,000 feet high. He followed a canyon on the Colorado side fifteen miles with a similar result. At least we determined to take desperate chances. Taking all our provisions and outfit from the boat, we prepared to attempt to follow a faint bighorn trail for a few miles. Lieut. Potter and the rest of the party went on ahead, while I stayed with the boat. The plan was to turn the boat loose and let it shoot the rapids empty and unguided. Lieut. Potter and his party would attempt to catch it as it went by. I waited half a day, and in that time the lieutenant had reached the river three miles further on. Then I turned the boat loose, and in ten minutes it shot by them like a race horse. That left us but one alternative, to follow the bighorn trail. Taking provisions, a blanket each, and our firearms, we started on this perilous journey. Sometimes our path was 100 feet wide, sometimes, for 100 feet we had scarcely six inches to cling to. In the latter situation onr sensations were horrible. Over 1,000 feet below us yawned the black chasm; beneath us the rock was treacherous and slippery. It was always level, always the same dizzy height from the white, brawling steam below. For twenty-two miles we followed this dangerous trail. Then, with feelings of joy, we emerged upon the Hualapais Desert. We were three days in crossing this. We had plenty of water and provisions, but the men's shoes had given out and they suffered greatly from the hot sand and the cacti. On the third day we reached the Union Pacific Railroad and were taken up. We then proceeded to the Needles and completed the trip as originally contemplated without incident. We found that the river could not be navigated advantageously by any vessel drawing more than two or three feet of water without the expenditure of an immense sum of money."

A Visit to a Slate Quarry.

At Festiniog are situate some of the largest slate quarries in North Wales. We find in the *Building News* the following graphic description of a visit to the locality:

Passing over an iron bridge we were soon in the midst of the busy scene. All around extended the workings, the sides of the mountains being strewn with slate, which to an outsider seems to be wasted in a very prodigal manner.

Down the precipitous sides, every now and again, a huge mass of slate is hurled by the quarrymen above, and as it jumps and tumbles down, the crackling and crashing of the waste slate adds not a little to the prevailing noise. In the distance we hear the boom of blasting, and in all directions trucks hurry along, some in strings laden with waste, while single ones rush up and down very steep inclines. These last are worked in couples with an endless chain and drum, and ringing, rattling noise they make being most startling to the visitor. Not infrequently these chains break, when, it may be imagined, the position of the unloading gang at the bottom is somewhat awkward.

At a certain point our guides stretched themselves prone upon the ground—we following their example—and crept to the edge of a cliff. Peering over, a sight met our view which was interesting to a degree; four hundred feet below lay the busiest and most remarkable portion of the workings. Almost immediately beneath us was a huged gray colored chasm, its entrance all misty with the smoke and dust of the blasting which was going on somewhere deep down in the bowels of the mountain. Around this opening for some distance was a cleared space alive with pigmy men, who were busy loading and unloading the various trucks which kept arriving from all directions, some appearing every now and again out of the chasm, others working by the tank system in stages, while the majority came pelting down the mountain side, held by a thin bright thread which glistened in the sun, this was the chain system spoken of. From the clearing around the chasm, lines of tramway led away to the railway, along which strings of trucks drawn by horses toiled continually. Leaving our birdseye view, we walked along until we reached the workshops. In a large building the different processes of bringing the slate into shape were going on in full swing; wheels spinning overhead, with driving bands in all directions, sawing, planing, and lopping the slate into sizes. Everything apparently was done by machinery, with but one exception, as far as we saw, of rendering or splitting the slate into the thin slabs technically known as "slates;" this appears to be entirely done by hand. The process is very simple but very interesting. The render sitting upon a block, with a pad on his legs, is supplied by boys with slabs about an inch and a half in thickness. Taking one between his knees, after having selected the truest end, he taps it with a broad blunt chisel and mallet, prising it open; then, with a turn of the wrist, rends the slab in twain. Often when he appears to have come to the last slate which can be got out of the slab,

he will again render it, apparently as easy as the first time. We watched one man for perhaps ten minutes, while he did over a hundred slates, and did not see one mistake. After this procesa they taken to a revolving hollow drum with stout iron blades, and are held by a man on a fixed bed or frame, with a gauge attached to it, and squares up into the different sized slates.

Leaving the shops we went on until we came to some sheds, where was a shaft descending to the lower workings, passing on our way an old man sitting in a slate hut, who, assisted by a boy only, was busy rending, lopping, and slacking small sized slates, looking as though he adhered tenaciously to the old style, and scorned the idea of the new-fangled machinery. At one of the sheds we procured candles and then waited for the tank, or skip, to come up, which it presently did with a laden truck; this being pulled off on to the tramway, we stepped on to the tank in its place. The water was then turned on, and the tank filling, the weight of the water soon counterbalanced the loaded (empty) tank at the bottom. The water being turned off, we began to move, and down we went, until, after about a minute's journey, a gentle bump told us we were at the bottom. A rumbling noise and a shout warned us of the approach of some trollies drawn by a pony. We just managed to evade them, but not without some of the party getting very wet. The train we returned by carried about 300 quarrymen, who dropped off the trucks at the nearest point to their destination. These men work in gangs and earn very considerable wages.

Cuttle-Fishes.

It was during my first visit to Brazil that one day, while busily engaged in examining a reef at a little town on the coast, called Guarapary, my eye fell on an object in a shallow tide-pool, packed away in the crevice of the reef, which excited my curiosity. I could see nothing but a pair of very bright eyes; but concluding that the eyes had an owner, I determined very rashly to secure him. I had been handling corals, and seemed to have forgotten that all the inhabitants of the sea are not harmless. I put my hand down very quietly, so as not to ruffle the water, when suddenly, to my surprise, it was seized with a pressure far too ardent to be agreeable, and I was held fast. I tugged hard to get away; but this uncivil individual, whoever he was, evidently had as strong hold on the rocks as he had on my hand, and was not easily to be persuaded to let go of either. At last, however, he became convinced that he must choose between us, and so let go his hold upon the rocks, and I found clinging to my right hand, by his long arms, a large octopod cuttle-fish, and I began to suspect I had caught a Tartar. His long arms were wound around my hand, and these arms, by the way, were covered with rows of suckers, somewhat like those with which boys lift stones, and escape from them was almost impossible. I knew that this fellow's sucking propensities were not his worst ones, for these cuttle-fishes are furnished with sharp jaws, and they know how to use them too, so I attempted to get rid of him. But the rascal, disengaging one slimy arm, wound it about my left hand also, and I was a helpless prisoner. In vain I struggled to free myself,—he only clasped me the tighter. In vain I shouted to my companion,—he had wandered out of hearing. I was momentarily expecting to be bitten, when the "*bicho*" suddenly changed his mind. I was never able to discover whether he was smitten with remorse and retired with amiable intentions, or whether he only yielded to the force of circumstances. At any rate, he suddenly relinquished his hold upon my hands and dropped to the sand. Then, raising himself on his long slimy arms, he stalked away towards the water, making such a comical figure that in spite of my fright I indulged in a hearty laugh. He looked like a huge and a very tipsy spider, staggering away on his exceedingly long legs.

The cuttle-fish belongs to the Mollusks, a branch of the animal kingdom distinguished for its members being built on the plan of a sac, and to which Mr. Hyatt has applied the more appropriate name of *Saccata*. The cuttle-fishes are distinguished from all the other Mollusks, such as snails, clams, etc., as having a large head, a pair of large eyes, and a mouth furnished with a pair of jaws, around which are arranged in a circle eight or ten arms furnished with suckers.

In the common cuttle-fish or squid of our coast, the body, which is long and narrow, is wrapped in a muscular coat or mantle, like a bag fitting tightly to the back, but loose in front. It is closed up to the neck, where it is open like a loosly fitting overcoat, buttoned up to the throat. Attached to its throat, by the middle, is a short tube, open at both ends. This tube, or siphon as it is called, is fastened to its throat, and can be moved about in any direction.

The animal breathes by means of gills, which are attached to the front of the body inside the cloak, and look like the ruffles of a shirt-bosom. By means of these gills the air contained in the water is breathed, and they answer the same purpose for the cuttle-fish that our lungs do for us.

In order to swim, the animal swells out the cloak in front, so that the water flows in between it and the body. Then it closes the cloak tightly about the neck, so that the only way the water can get out is through the siphon. Then it contracts very forcibly its coat, which, it must be remembered is a part of the animal, and the water is driven out in a jet from the siphon under the throat, and the body is propelled in the opposite direction; that is, backward, like a rocket through the water. This siphon is flexible like a water-hose, and can be bent so as to direct the stream not only forward, but sideways and backward, so that the animal can move in almost any direction, or turn somersaults with perfect ease; and so rapidly do some cuttle-fishes swim, that they are able to make long leaps out of the water. Usually, however, the animal swims backward, with its long arms trailing behind. Our common cuttlefish of this coast has, in addition to its eight arms, two long slender tentacles, which may be withdrawn into the body. The tail is pointed, and furnished with a fin on each side.

The Octopods, to which the Brazillian cuttle-fish belongs, have round purse-like bodies, and eight arms united at the base with a web, and they swim by opening and shutting their arms like an umbrella; in this mode of swimming they resemble the jelly-fishes.

The paper nautilus is nothing in the world but a female cuttle-fish that builds a shell. There was a very pretty story told of her habits, by Aristotle, the old Greek naturalist, which everyone believed until quite lately. He said that she rode on the top of the waves, seated in her boat-like shell, and

spreading her broad arms to the winds for sails. But unfortunately the story has no foundation in fact. She either crawls about on the bottom of the sea, or swims quite like any other cuttle-fish, shell foremost, only occasionally coming to the surface. Strangely enough, she holds the two broad hand-like extremities of the arms against her body, and it is the inside of these arms that secrete the paper-like shell, which is only a sort of cradle for her eggs.

Not so with the pearly nautilus, which is furnished with a beautiful coiled-up pearly shell, formed on the outside of the animal. This shell is divided into numerous chambers, and the animal living in the outer one builds a partition across the back part of it as the shell grows.

Cuttle-fishes are sometimes used for food by the Brazilians, and different species may be seen in the markets, where one frequently finds them still alive. Sometimes, as we stoop to examine one, its body is suddenly suffused with a deep pinkish glow. Before we have time to recover from our surprise this color fades, and a beautiful blue takes its place as rapidly as a blush sometimes suffuses a delicate cheek. The blue, perhaps, is succeeded by a green, and then the whole body becomes pink again. One can hardly conceive anything more beautiful than this rapid play of colors, which is produced by the successive distention of sets of little sacs containing fluids of different colors, which are situated under the skin.

The cuttle-fish is also furnished with a bag containing an inky fluid which when the animal is attacked or preserved, it ejects into the water; thus completely blinding its adversary and effectually covering its retreat. It is from this fluid that the *sepia* is made. Besides carrying an ink-bottle, some species of cuttle-fish are provided with a long, delicate, horny pen, which forms a sort of stiffener to the back. In some species the pen is hard, thick and broad, and the cuttle-fish bone of commerce is is pen of this kind. The species found in our waters is very small, and not at all dangerous, being barely large enough to draw blood from the hand; but in the tropical seas they are very large, powerful and dangerous.

□ The cuttle-fish is the original of Victor Hugo's devil-fish, so vividly described in the "Toilers of the Sea." If the devil-fish were a beneficent creations, I should be sorry to destroy your faith in it; but as it is, I believe it will be rather a relief than otherwise to know that in some important respects Victor Augo's story of it is a fable. The kraken was a mythical cuttle-fish of fabulous size.—*Lucie L. Hartt in The American Naturalist.*

Sulphur Mining in Louisiana.

The Standard Oil Company has finally solved the great problem, on which hundreds of thousands of dollars have been spent in vain, of getting at the immense mass of sulphur which lies some hundreds of feet below the surface in Calcasieu Parish, Louisiana. For thirty-five years company after company has experimented with this deposit of surphur which is probably the largest in the country, and is valued at from $30,000,000 to $100,000,000. There was no doubt about the sulphur being there, but unfortunately between it and the surface lay an immense quicksand, which could not be removed, excavated or bored though. There was no way of man reaching the sulphur and getting it up. A small town, Sulphur City has, grown up in the neighborhood of the mines, at which lived the operatives engaged in trying to solve their problem. As the expenses of these employes had to be paid, and as not a pound of sulphur was obtained, the several companies organized to mine it went, one after another, into bankruptcy, until the property fell, a short time ago, into the hands of the great Standard Oil Company.

Long before the discovery of petroleum in Pennsylvania a party of hunters stumbled on a petroleum spring in Calcasieu. The Louisiana Petroleum Company was organized to mine for it, and while mining discovered that side by side with the oil was one of the most valuable deposits of nearly pure sulphur in the world. The sulphur was 400 feet below the surface and extended below 800 feet further. There was no doubt or question about this, but, unfortunately, just above the sulphur was a quicksand 160 feet thick. One effort after the other to reach the sulphur failed. The drill stuck an underground well then a gas well. After several deaths the American Sulphur Company gave up the enterprise. Then a Belgian engineer undertook the work and endeavored to neutralize the quicksand by freezing it solid and boring it through, and erected valuable refrigerating machinery for that purpose, but the quicksand would not stay frozen and that system of mining had to be abandoned.

Within the last few weeks the Standard Oil Company has got control of the property. It set about mining in a fashion the very opposite to that of the Belgian engineer. Instead of using freezing as the means of getting at the sulphur, it is trying heat. Superheated water is forced through ten inch pipe on the sulphur, melting it, and the liquor sulphur water is then pumped up. A little exposure to the air, so as to evaporate the water, leaves almost pure sulphur. The experiment has been a success beyond expectations.—*The Mineral Collector.*

A favorite contributor in the NATURAL SCIENCE NEWS, Mr. Angus Gaines, of Vincennes, Ind., writes very entertainingly on "My Water Snakes," in the New Year's double number of the *Youth's Companion.* The esteem in which *The Companion* holds Mr. Gaines's work is shown by the fact that his name had a prominent place in its announcement for 1896, of which more than a million copies were circulated.

How to Clean Old Book Plates.

To restore old book plates that have been injured by age and damp proceed as follows: Place upon a flat surface a sheet of white paper, somewhat larger than the print to be cleaned. Carefully dampen the print on both sides with a soft, wet sponge, and then saturate it with a mixture of chloride of lime and oxalic acid dissolved in about equal proportions in a pint of cold water. You can tell when the mixture is right by its turning magenta color. Continue to apply it until every stain or spot has disappeared, and then with a clean sponge wash the print freely with cold water.—Art American.

A Rare Coin.

When Louisiana seceded, Jan. 26, 1861, the new government seized the United States mint at New Orleans and struck $2[illegible]4,820 in double eagles and $1,101,31 50 in silver half dollars, using the United States dies for 1861. The bullion was exhausted in May, 1861, when the coinage ceased, and the United States dies were destroyed. A Confederate states die was then made, to be used for silver half dollars, but it was not fit for use in a coining press, the relief being too high. Four half dollars were struck with it on a screw press and these comprise the entire coinage of the Confederate states. They are worth about $250 apiece to dealers.—Collector.

Natural Science News.

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NATURAL SCIENCE NEWS

VOL. I. No. 51. ALBION, N. Y., JANUARY 18, 1896. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED.—To trade a good Smith & Wesson revolver for an ostrich egg or a set of swans. Must be first-class. C. E. CALHOUN, 617 S. Emp. Ave., Wichita, Kans. o.50-2t

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Continued on 3d ad. page.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
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Natural Science News.

VOL. I ALBION, N. Y., JANUARY 18, 1896. No. 51

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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The Art of Collecting Birds.

Personal experience is a good, and in fact the only adequate, teacher we can have in learning any art. The need of such a teacher is felt by none more than by the naturalist who wishes to bring together a complete collection of the birds of even his own immediate district. Hence I trust I shall not be accused of egotism, if, in this section, I endeavor to impart to the reader some things that experience has taught me.

It is of first importance for the collector to gain as complete a knowledge as possible of the notes and habits of birds, and of the localities frequented by those he wishes to procure. This knowledge may be gained by carefully studying the writings of men who have paid particular attention to the subject. *Too* much dependence must not be placed on books, as the best of these contain error as well as truth; besides, birds are very variable in their habits in different localities. The collector must then depend mainly upon himself. He must visit *every* locality, —the mountain-top and the dark swampy thicket, as well as the meadow, the plain, or the open forest, as in each of these localities he will find species that he may not meet elsewhere. A little patience will help any one through the worst of places.

The quaking bog, where a misstep may plunge the adventurer into the slimy ooze, is also an excellent locality for certain species. But when the collector returns home wet and hungry, fatigued and disheartened,—as he now and then will,—let him not be discouraged. Try again! the next day, and even the next, if need be, until the desired specimen is obtained. After all, the earnest naturalist will be amply rewarded for the exercise of patience and perseverance by securing a rare specimen.

The *true* naturalist never thinks of cold and disappointment, of days of fatigue and hours of patient watching, when at last he holds in his hand the long-searched-for bird. Ample reward is this for all his former trials; he is now ready to go into bog and through brier. And thus the enthusiastic naturalist travels on, not discouraged by toil and trouble, laughed to scorn by the so-called "practical" men, who are unable to appreciate his high motive. This, however, he forgets when in field or study he meets with the cordial greeting of his brother naturalist, as they with mutual interest relate their discoveries and adventures.

To the traveling collector a few special hints are necessary. While visiting a remote region, but little known, one should not neglect to shoot numbers of every bird met with, even if they are common species at home, as they will not only furnish data on the distribution of the species, but they may present interesting characters peculiar to that locality. If a certain species appears common, do not delay collecting specimens, for peculiar circumstances may have brought them together in unusual numbers; at some future time they may be rare.

A well-trained dog is of great value while collecting birds, especially the Quails, Marsh Wrens, Seaside and Sharp-tailed Finches,—in fact, all birds that are difficult to start in open meadows and grassy places. While searching thickets, great watchfulness should be observed, especially in the autumn, when many birds have no conspicuous note, otherwise many of the more wary of the Warblers will escape notice. The slightest chirp should be carefully followed; the slightest motion of the branches closely watched. If a bird is seen that is not fully recognized, it should be shot at once, for in no other way can it be determined whether it is a *rara avis*.

By carefully watching the motions of birds, the collector will soon become so expert as to be able generally to distinguish the different species of Warblers, even at a distance. Carefully scrutinize also the tops of tall forest trees, as I have there taken, in autumn, some of the rarest Warblers.

In spring male birds are quite readily found, as they are then in full song; but the same caution must be used in collecting females that is practiced in autumn, as they are generally shy and difficult to find. Hence it is a good rule always to secure the female *first*, when she is seen with the male; for in spite of all the collector's efforts, he will find that there will be four males to one female in his collection.

During winter some birds may be found in the thick woods that one would hardly expect to find at this season, such as the Robin, Golden-winged Woodpecker, etc. The open fields should not be neglected even during snow-storms, as it is then that such ordinary cautious birds as the Snowy Owl may be approached quite readily; or the capture of a Jerfalcon may reward the collector for a disagreeable tramp. The salt marshes and sandy seashores are the resort of a great many winter birds, and the collector will perhaps find himself amply repaid for a few visits to these localities at this season.

Do not neglect to collect the young of birds; by procuring specimens of these from the time they become fully fledged until they attain the perfectly mature plumage, one becomes familiar with all the stages through which a given species passes, and will thus avoid many errors into which some of our eminent ornithologists have fallen,—that of mistaking the young of certain well-known birds for a different species from the adult, from not being acquainted with the immature stages. All birds should be taken that exhibit any unusual characters, such as unusually large or small bills or feet; or change of plumage, such as very pale, or very bright, cases of albinism, etc.

The gun used by a collector should have a small bore, not larger than No. 14 for shooting small birds; for Ducks, and other large water-birds, one of larger calibre will be found more effectual. The best shot to use for small birds is "dust shot" if it can be procured;

if not, No. 12 will answer. No. 8 will do for Ducks and large birds. For Hawks and Eagles, wire cartridges are the best.

In shooting small birds, load as lightly as possible. Put in no more shot than is required to kill the bird. As you can approach very near most small birds, you will find by experiment, that you can kill them with very little shot. If too much powder is used, it will impel the shot with so much force as to send it completly through the bird, thereby making *two* holes, when less powder, by causing less force, would have made only *one*, and the bird would have been killed just as effectually. When shot goes into the body of a bird, it generally carries feathers with it, and in a measure plugs the hole; but when it is forced through and comes out, it often carries away a small patch of feathers and skin, leaving an open wound, from which the blood flows freely.

If the bird is not instantly killed by shooting, the thumb and forefinger should be placed with a firm pressure on each side of the body under the wings, when it will soon die. This operation compresses the lungs and prevents the bird's breathing. Besides mercifully ending its suffering, its death causes the flow of blood in a measure to cease, for this reason it should be killed as quickly as possible.

The mouth, nostrils and vent should now be plugged with cotton or tow. By blowing aside the feathers the shot holes may be detected; if they bleed, or are in the abdomen or rump, a pinch of calcined plaster* should be placed upon them; this absorbs the blood, or any fluid that may ooze out. When shot enters either the abdomen or rump, it is apt to cut the intestines and set free the fluids contained therein. If the blood has already soiled the feathers, remove as much as is possible with a knife, then sprinkle plaster on the spot, and rub the soiled feathers gently between the thumb and fingers; this, if repeated, will generally remove any spots of blood, etc., if the operation is performed before the blood becomes dry. When the blood is dry, it is removed after the bird is skinned, as will be hereafter described.

Next make a note of the color of the eyes, feet, and bill of the specimens, also note the color of the cere in birds of prey, and the naked skin of the lores and about the bill of the Herons, also about the heads of the Vultures. After smoothing the feathers carefully, place the bird in a paper cone† head first, then pin or twist up the larger end, taking care not to injure the tail-feathers. The blood can be washed from the feathers of all the swimmers, but the bird in this case, should be allowed to dry before packing in paper. If grease or oily matter has oozed out upon the feathers, the bird should not be washed, but the plaster be used as before, only in larger quantities.

All traces of blood should be instantly removedfrom white feathers, as it is very apt to stain them if it remains upon them long. The paper containing the bird should be placed in a light basket,—a willow fish basket is the best for this purpose,—suspended by a strap over the shoulder, and resting upon the hip. If there are but one or two birds in the basket, it should be filled with grass, or loose paper, to keep them steady, as otherwise they might receive injury by rolling from side to side. In packing birds, avoid putting the largest at the top, as their weight will cause the smallest to bleed. Do not hold a bird in the hand any longer than is necessary; if possible, take it by the feet or bill, for the perspiration from the hand tends to impair the gloss of the plumage.

A good collector must practice, in order to become a good shot. He must always keep his gun in readiness, for at any moment a bird that he desires may start up at his feet, or peer out from the bushes for only an instant before flying away; by being ready, he will thus secure many birds that he would otherwise loose.

To be in readiness at all times, the gun should be carried in the hollow of the left arm, with the the muzzle pointed backwards, or with the stock under the right arm, with the muzzle pointed towards the ground which is undoubtedly the safest way, especially if you are hunting with a companion. Too much caution cannot be used in handling a loaded gun, especially by a professional collector, who may spend two-thirds of his time with a gun in his hand. A gun should never be carried in other than three ways,—the two above mentioned and directly over the shoulder. If the collector becomes accustomed to these ways, which are all perfectly safe, he will never think of any other. Surely, this caution is necessary to one who is traveling through all sorts of places, when a slip or a fall with a carelessly held gun might cripple him for life, by an accidental discharge.

While passing through thick bushes, *always* carry the gun under the arm, as this prevents its accidental discharge by the bushes catching the trigger or hammer. Never allow the muzzle of the gun to point at any one, even for an instant. All these things depend upon habit, and will cause a thoughtful man, who has handled a gun for a long time, to be much more careful than a person who seldom takes one in his hands. The thougtful man prefers rather to avoid accidents to himself and others—by care in advance—than to risk the chance of having to mourn his carelessness afterwards. The various devices for snaring birds are undoubtedly the best ways to secure them without injuring their plumage. But the collector will have to rely mainly upon his gun; and by following the above instruction regarding the light charges, he will find that he will generally kill a bird without injuring its plumage seriously. If he carefully attends to it afterward in the way described, he will save himself much trouble when he wishes to preserve it.

In an old French cook-book may be found a receipt for a rabbit-stew, commencing with, "First catch your rabbit," etc.,—which rule is applicable to the collector. First, study with attention the art of collecting. Many and long have been the lessons in collecting that I have taken in long tramps through sunshine and storm, in the bracing air among the mountains of Northern Maine and New Hampshire, on sandy islands and rocky shores, amid the luxuriant forests and along the rivers and lagoons of semi-tropical Florida. Hours of danger and perplexity have been mingled with days of inexpressible pleasure, which all must experience who study from the Great Book of Nature. Not easily, then, I may add, have I learned what I am trying to impart to others in these pages.

Since writing the preceeding, I have been informed by my friend, Mr. W. Brewster, of Cambridge, that in collecting such small birds as the Warblers, Sparrows, Wrens, etc., he has used a "blow-gun" to

* This is burned plaster or gypsum, and is used by stucco-makers. If it cannot be procured, the unburned plaster or common ground gypsum used by farmers, or air-slacked lime, pulverized chalk, or ashes.—in fact anything that will absorb the blood,—will answer.

† The leaves of an old pamphlet are about the right size for making cones for small birds, and can be easily obtained.

great advantage, constructed somewhat after the pattern of the celebrated instrument that is used by the natives of some portions of South America to shoot poisoned arrows. His "gun" is made of pine-wood, and is about four feet and a half long, it is bored smoothly the whole length with a quarter-inch hole. For ammunition Mr. Brewster uses balls made of soft putty. These, blown at birds, will hit them hard enough to kill, if the gun be aimed rightly, which art can be acquired by practice. This is certainly the preferable way to collect small birds, as it does the plumage no harm. I would suggest, however, that a tube of thin brass be used in place of wood; if it were longer, say six feet, it would carry with greater force and more accuracy. Glass would be still better, if it could be supported by wood to prevent breakage, as it would be much smoother. The balls of putty should be made to fit moderately tight. I have never tried this method myself, but Mr. Brewster has, in a satisfactory manner, as described above. I only wait an opportunity to test them myself, and trust that others will do the same.—*From Maynard's Naturalists Guide.*

Preliminary Note on a New Alkali Mineral.*

While searching recently at Borax Lake, California for the new species sulphohalite, Mr. C. H. Northup discovered small crystals of what he considered to be a new form of that mineral. Mr. Northup reports that they are very rare, having been found during a laborious working of the "tailings" or debris from an exploratory boring known as the "New Well," made by the Borax Lake Mining Company, and that they were undoubtedly formed in stratum of clay reached at a depth of about 450 feet.

The entire find was forwarded to Dr. A. E. Foote, to whom the writer is indebted for the material used in this brief examination.

CRYSTALLIZATION, ETC.

The mineral crystallizes in regular octahedrons, whose diameter rarely reach one centimeter. They occasionally exhibit triangular markings and a habit of parallel grouping in more or less regular aggregates. Fractnred crystals show in the interior a cross of faint lines running perpendicularly to the crystal faces. These are divided by darker planes lying parallel to cubic symmetry, and passing through the angles of the octahedron, dividing it into eight parts. The same thing is noticeable in the clearest of the complete crystals, a bundle of striæ coming from the center of the crystal to the center of each face with the dividing planes clearly visible. This phenomenon is strikingly similar to that observed in cubes of boleite (figured by Bombicci in a memoir on mimetical pyrite, Bolgona, 1893). The markings in the present instance are probably due to inclusion of organic matter, as in chiastolite.

The color varies from dirty white, pale yellow and greenish gray to dark brown; the lighter colored crystals closely resemble senarmontite. Cleavage is imperfect. It is brittle and shows uneven fracture. Luster, vitreous on broken surfaces, occasionally bright on crystal planes. Hardness, 3·5 to 4.

CHEMICAL EXAMINATION.

In powdering the mineral a fetid order is distinctly perceptible. It is easily fusible before the blowpipe; in the closed tube it blackens and gives off a burnt odor with violent decrepitation and liberation of water (which subsequently proved to be mechanically included), finally fusing to a gray mass. Boiling water effects partial decomposition of the powdered mineral, with separation of a bulky white residue, consisting mainly of basic carbonate of magnesia. It is decomposed with effervescence in cold dilute hydrochloric acid, with slight residue insoluable.

A careful qualitative analysis of crystal fragments showed it to consist essentially of sodium, magnesium, hydrochloric and carbonic acids, indicating a *double cloride and carbonate of sodium and magnesium.* Traces of phosphoric acid, silica, iron, calcium and organic matter were also found. This composition is quite as remarkable as that of other species peculiar to the Borax Lake region.

The name "*Northupite*" is proposed for this new species, since it was entirely due to Mr. Northup's indefatigable zeal in collecting that the mineral was brought to light. Professor Penfield has promised to make a quantitave analysis of this and several other interesting minerals found in association, at least one beside the Northupite being new.—*By Warren M. Foote in American Journal of Science.*

* A revison of a paper read before the meeting of the Philadelphia Academy of Natural Sciences, Aug. 27, 1895.

The Merits and Demerits of Linnaeus.

To the great Swedish naturalist Linnæus, who was born in the year 1707, belongs the honor of having first orginated a system of classification of the vegetable and animal kingdoms, which system (although Linnæus himself remained perfectly orthodox, believing in the theory of special creations) contained in itself the germ of the evolution doctrine, now grown to such mighty proportion. In regard to the account of the creation given in the book of Genesis, we must (with Haeckel) acknowledge that it reveals two grand fundamental ideas, namely, differentiation and progressive development of the matter "created" in the beginning." Together these form a grand conception, perhaps, far more important to the truth of the narrative than the now ascertained error of considering this little earth as the center of the Universe, around which sun and stars revolve This error was confuted by Copernicus, Galileo, and their successors. Another important change in the popular ideas of creation, namely with regard to the position of man in the whole scheme, has been effected by Lamarck, Darwin, and others. It is strange that theologians should so frequently, as they do, content themselves with asserting the literal accuracy of so ancient a book as the Bible, which has suffered severely by the course of tradition and the vagaries of translators, in place of confining themselves to the grand moral lessons and the pure religious principles it inculcates. The Bible is not a text book of natural science, nor has it ever pretended to be one.

The great progressive step made by Linnæus was as simple as it was rich in results. It was the designation of each plant and animal by two names. The first, the genus, was given to each family of plants or animals; while the second the species, gave greater definition and more individuality to each single plant or animal. Thus, for instance, he included all animals resembling the tiger, whether large or small, under the genus *felis,* and he used the name for the whole class; and he added a second name for the species to which the animal belonged. Thus, he called the common tiger *felis tigris,* the lion *felis leo,* the panther *felis pardus,* the jagnar *felis onca,* the wildcat

felis catus, and the house cat *felis domestica*. This method was perhaps suggested to him by the custom in society of having family names and baptismal names, by which members of the same family may be distinguished. Before the time of Linnæus, the different names of the individual plants and animals formed a perfect chaos; but the dual nomenclature not only necessitated a classification, but became its basis. The two names soon proved the value of the system, as by them attention was drawn to the similarity and relationship between the various plants or animals. Linnæus in fact attempted to complete the whole system, and divided, for instanch, the whole vegetable kingdom into 24 classes, which be subdivided into orders, these into genera, and these again into species. Notwithstanding that his classification has been modified, and has been based on facts since ascertained to be more fundamental than those on which he grounded his theory, the honor of the reform belongs to him; although he was often in doubt, especially whether some particular animal had to be considered as a separate species, or only as a variety of the same species. He even went so far as to admit that hybrids may constitute the origin of new species. and even that a great number of new species had originated by the interbreeding of other species. This opinion was very remarkable as that of a man who had already accepted the theory of the miraculous creation of every species; and it would have been in direct contradiction to his creed, were it not that he had claimed as an exception to the rule that some species were originated by hybridism or incidental changes: and all that Lamarck and Darwin did was to extend Linnæus' exceptional theory to the origin to all species whatsoever.

In regard to the origin of the distinct species, Linnæus, as before remarked, believed in special acts of miraculous creation, and adhered strictly to the Mosaic account, according to which plants and animals were created by God, "each after its own kind." Linnæus expanded the idea, and went into details, expressing the belief that, originally, either a single individual or a pair of each animal or plant had been created. He believed that "man and wife created He them" of every species which exists in two sexes; however, in those cases where every individual is possessed of both sexual organs, as is the case with many kinds of snails, worms, parasites, and the majority of plants, Linnæus believed that God created only one individual, as this was sufficient. Linnæus further believed that, in the deluge, all the then existing organism were drowned, except the few individuals of the species which were saved in Noah's ark, and afterwards put ashore on Mount Ararat. The geographical difficulty of which widely differing animals and plants living together when put ashore, he explained by the fact that Ararat, in Armenia, is situated in a warm climate; and being more than 16,000 feet high, it unites in itself all the conditions for affording diversity of climate to suit animals of different zones. The animals accustomed to the climate of the polar regions, such as polar bears, could therefore at once ascend to the cold snow-covered summits; those accustomed to a warm climate could go to the foot; while the inhabitants of the temperate region could remain where they were, half way up. From this mountain, he asserted, the animals distributed themselves afterward again over the whole earth,

Haeckel makes a serious objection to the possibility of existence of a single pair of animals of each kind at the same time. He says that, for the first few days after the creation or after the deluge, the carnivorous animals would have eaten all the herbivorous cattle, the lions and tigers would have eaten the single pairs of sheep and goats in existence; while the herbivorous animals would have eaten as once all the single plants before there was a chance of propagation. Certain it is that the balance in the economy of Nature, such as we see it now, could never have existed if only one single pair of each species had been created at the same time. It is seen, then, that the hypothesis of Linnæus is scarcely worth a serious discussion; and when we consider that he had a clear head and excellent reasoning powers, it is indeed very doubtful if he could believe in it himself.

This hypothesis prevailed, however, for about a century without being disputed; and this was perhaps partially due to the merits of Linnæus as a naturalist, and the great renown he had earned by his systematic description of the works of Nature. This, added to the prevailing idea of considering the Bible to be intended to teach the sciences, retarded the acceptance of sound and correct ideas concerning the institution of the Universe.

In closing this review of the merits and errors of Linnæus, we cannot abstain from expressing our surprise that Professor Huxley in his recent lectures in this city, selected Milton in place of Linnæus as the defender of the six day miraculous creation. Milton should be considered by every one as drawing on his imagination, and availing himself of poetical license to the fullest extent. He was no scientist, but a poet; and he should on this account not be held responsible for his *quasi* scientific opinions. But Linnæus was a scientist, and his opinions, hypotheses, and theories fall within the pale of scientific criticism: and he was especially scientifically definite in all he said and wrote. If Professor Huxley selected the poet because everybody knows Milton and his works, we may suggest that some information about the great naturalist Linnæus and his services to Science would have served the purpose, of bringing out the truth of the evolution theory, far better than the beautiful poetical dreams of "Paradise Lost."—*P. H. Vander Weyde, in Sci. Am.*

Arizona's Petrified Forests.

The Legislative Assembly of Arizona has addressed a memorial to Congress, asking that the lands covered by the famous "petrified forest" be withdrawn from entry and be made a public park. This so-called "forest" of chalcedony is in Apache County. An area of ten miles square is covered with trunks of agatized trees, some of which measure 200 feet in length and 10 feet in diameter. Ruthless curiosity-seekers are destroying the trees by blasting them to pieces in search of the pretty crystals which are found inside many of them. Limbs and similar pieces are shipped away by car-loads to be ground up for various purposes. It is urged that to make the tract a public park would preserve it from vandalism and would injure nobody, inasmuch as there are no settlers on it. The other day a cowboy rode over the "agatized bridge"* on horseback, ing to try break down the tree that spans the chasm, and was disappointed at not succeeding.—*Rene Bache in Boston Transcript.*

* See NATURAL SCIENCE NEWS of Dec. 16th, No. 46, for an illustration of this bridge.—ED.

Natural Science News.

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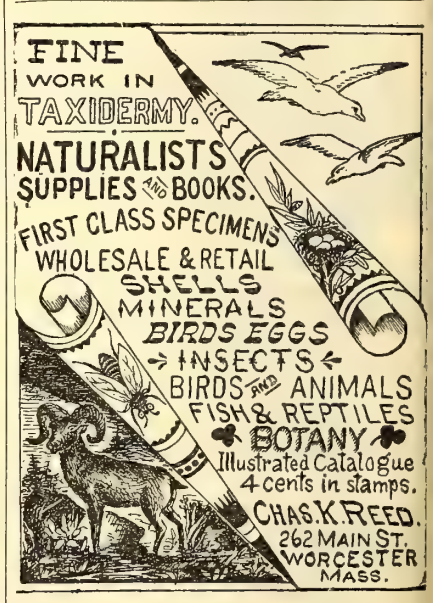

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NATURAL SCIENCE NEWS

VOL. I. No. 52. ALBION, N. Y., JANUARY 25, 1896. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WORLD'S FAIR Tickets in sets of 30 which I will exchange for singles, relics, shells, curiosities and skins. Address, E. T. LANGWORTHY, 413-70 Court, Chicago, Ill.

TO EXCHANGE.—Sets of 191 1-4, 1-3, 333 1-4, 339 2-3, 2 2, 340 1-5, 608 1-3 and others. Want Cooke's New Chemistry, Nicholson's Zoology and other books. FRED MCALLISTER, Davison, Mich.

FOR OFFERS.—Tenting on the Plains, Mrs. B. Custer, $1.50, Little Rivers. Henry VanDyke, $2, new 1895, A. 1. condition. Books wanted. G. N. UPHAM, Coffeyville, Kans.

BIRDS IN THE MEAT to exchange for eggs, books and papers on out door life and ornithology, stamps or cash. R. H. ROCKWOOD, Waterville, Me.

SOUTHERN Bird or mammal skins for others, medical books, mammals on all subjects, for skins or museum specimens. J. J. WIRZ, Taxidermist, Augusta, Ga. 52-2t

WANTED.—Autographs of famous men and women of the past or present. For such have a great many curios, books and cash to offer. F. O. NELSON, 412 S. Main St., Butte, Mont.

WANTED.—Best exchange for Davie's Nests and Eggs, cost $1.50, good condition, or best cash offer. HAROLD A. GREENE, Box 277, Atlantic Highlands, N. J.

NATURAL SCIENCE NEWS Vol. I. to exchange for best offer of lightly cancelled U. S. stamps. Choice Cacti for stamps. MRS. AUSTIN DUSTIN, Box 488, Kewanee, Ill.

FOR SALE.—A medium sized mandolin, maple shell light wood, cost $10 new, all in good condition, or would like to exchange in part for camera. H. A. CURTIS, So. Stoddard, N. H.

WANTED.—Perfect diurnal lepidoptera from the north-western, western and south-western states, in papers. Offer one examples of exotics. Entomological addresses especially desired. LEVI W. MENGEL, Reading, Pa. 52-2t.

EXCHANGE.—Amateur camera (takes snap or time pictures), complete outfit cost over $20, and pair of American Club racing skates, cost $5, both in fine condition, for microscope instruments for taxidermists, revolver or shot gun. RICHARD MCMURTRIE, East Coulter St., Germantown, Phila.

CROW.—The "Office Crow," an indispensible tool for every desk. Ink eraser, burnisher for laying smooth after erasing, paper cutter, pencil sharpener, pencil eraser, type-writer's eraser, pen extracter, etc. Price 30c., post free. H. F. BUTLER, Newton Highlands, Mass.

FOR EXCHANGE. One pound Dr. Gibbs' compound for mounting or preserving birds with full instructions given for 75c. worth good sets with data or anything desirable. JOE H. ARMFIELD, 358 So. Ashe St., Greensboro, N.C.

WANTED.—Shot gun and World typewriter. Will give opals or minerals. Would like a few Columbian stamps in exchange. ROBERT BURNHAM, Dennis, Mass. 52-2t.

WANTED.—Fox squirrel in meat, head of antelope and mountain sheep and first class skins of herons. Exchange or cash if cheap. F. M. RICHARAS, Farmington, Maine.

TO EXCHANGE.—Coutra Bass Ocarina, $3.25; Hornaday's Taxidermy, $.50; Davie's nests and eggs, $1.75; to exchange for best offers in musical instruments. CHAS. F. SWAN, Abingdon, Ill.

FOR EXCHANGE.—I have a large collection of sets and singles, some rare, which I will exchange for minerals, shells, curios, or sets Lists sent for yours. W. A. HORROM, Atlanta, Ill. 52-2t

TO EXCHANGE for sets, tanning process stops express and freight expense, sample of tanning for stamp, guarantee it to do the very best of work. ALMON E. KIBBE, Mayville, N. Y. 52 2t

EXCHANGE.—Flobert Rifle, books, pair skates, 1 Volume Youth's Companion, for Indian Relics, or eggs in sets. G. W. GEHMAN, 1,041 Windsor St., Reading, Pa.

MARLIN RIFLE for exchange, for new Pocket Kodak and part cash. Give description and enclose stamp for description of rifle. R. G. PAINE. 1,416 R. I. Ave. N. W., Washington, D. C.

EXCHANGE NOTICE.—I have the following duplicate to exchange, 622a 1-6, 591b 2 3, 5 2 1-4, 51a 2-2 1-3, (sing. 6¼) I desire to correspond with reliable persons intending to collect this coming season. R. S. DANIELS, Nordhoff, Ventura, Co., Cal.

To EXCHANGE,—Sets of Osprey, Razor-billed Auk, Gull-billed Tern, King Eider, Wilson's Plover, Black Guillemot, Pallass's Murre, and many more. CHARLES E. DOE, Box 1339, Providence, R. I.

FOR SALE.—Kombi and printing frame, $3.25 prepaid, cost me $3.95, good as new. CHAS. H. FINNE, Box 280, Little Rock Arkansas.

TO EXCHANGE.—Himalayan rabbits for silver-grey rabbits and Peruvian guinea-pigs. Send stamp for catalogue of Himalayan, and Dutch rabbits, Abyssinian and common guinea-pigs. Mention NATURAL SCIENCE NEWS. JOSEPH I. LAWERENCE, No. 123 West St., Worcester, Mass.

TO EXCHANGE.—Eggs of Magpie, Brown Towhee, Mt. Chicadee, and Black headed Grosbeak in singles. Make offers in books, materials, tools. CHAS. BARBER, La Porte, Ind.

TO EXCHANGE.—Skulls of Aberts Squirrel, Western Prairie Dog, Rocky Mt. Woodchuck, and Badger for supplies, books, or materials for naturalists. CHAS. BARBER, La Porte, Ind.

TO EXCHANGE.—Specimens of Barite with Quartz Crystals, from Cheshire Co. for other minerals. HARRY LATHAM, 84 Camp St., New Britain, Conn. 52-2t

FOR SALE:—Chinese coins, 2c: Chinese lottery ticket, 2c; Chinese Newspaper, 3c; Japanese Oblong Coins, 5c; Fine Specimens of Calcareous Tufa, 10c; 3 different Cal. eggs, 5c; 5 correctly named Cal. shells, 10c: Sand Dollars, 4c: Chalcedonyx, 5c. All specimens sent postpaid. Send 2c for a list of fine sets of eggs and curios, shells, etc., I have for sale. W. H. HILLER, 147 W. 23d St., Los Angeles, Cal. 51-3t

WANTED:—All collectors to know that they can save money by purchasing all of their seals, stencils, rubber and metal printing stamps, dating and numbering stamps of me. I can furnish everything in the line at very low price. Send me a description of what you want and get my price before placing your order elsewhere. Address R. W. FORD, Bristol, Conn. 51-2t

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

FOR SALE OR EXCHANGE:—One international postage stamp album and foreign stamps for United States stamps and birds eggs. G. ARTHUR BELL. Rome, N. Y. 51-2t

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, Dennis, Mass. 51-25t

I AM booking orders for fresh skins, etc., of January and February collecting, from the lower Mississipi. Prices very low. Will take rifle, revolver or reference books. H. C. BUTCHER, Galesburg, Ill. 51-2t

FOR SALE OR EXCHANGE:—American Long-eared Owl 3 years old next spring, is very tame. Price $5.00. What have you to offer? C. B. PAYNE, Cassadaga, N. Y. 31-2t

WANTED.—For lowest cash price or good exchange, recent text books on Zoology. G. N. UPHAM, Coffeyville, Kans.

FOR SALE.—Coast Birds in the flesh, Vols. XI and XII of the OOLOGIST, Vols. IX and X of *Ornithologist and Oologist*, Vol. I of the *Museum*. ALVAH G. DORR, Bucksport, Maine. J2t.

WANTED.—Good double shot gun in exchange for Natural History specimens, Deer heads, birds, etc. ALVAH G. DORR, Bucksport, Me.

SQUIDS AND OCTOPI:—I have left two jars of alcoholic specimens containing all told, I should estimate, 30 or 40 perhaps 50 specimens. Last June I sold dozens at from 46cts. to 96cts. and dealers usually sell them at from $1.00 to $3.00 each. In size the specimens in these jars will range from 1 in. to 1 ft. in length. The list will only be sold as a whole and to a student or some educational institution needing them they will prove a veritable bonanza at the price at which I am willing to close them out. I also have a large wax model slightly damaged of a Loligo opalescens on black walnut base. It was one from that famous $100,000 collection at the World's Fair. The entire lot of alcoholics including the wax model ought to bring me $50—certainly should be considered a bargain at $25, but I am willing to close out the entire lot for any [illegible] first as I do not care to be to the expense of returning your money. Many should want this lot, but the first letter gets them. Write quick should you have use for them. FRANK H. LATTIN, Albion, N. Y.

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ALBION, N. Y.

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And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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In reach of all. Cheaper than the cheapest. Now is the time to start a collection.

1.	Strombus alatus, 2 to 3½ inches	4c
2.	Fulgur perversus, 3 to 8 inch	6
3.	Fasciolaria tulipa, 2 to 6 inch	8
4.	" distans, 1 to 3 inches	4
5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ. 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella. 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch. single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

J. C. Baker successor to **Baker & Hanson**
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Of North American Bird Skins a specialty, also fine Mammal Skins, with Skulls, etc. Over 10,000 fine Bird and Mammal Skins in stock. Finely mounted heads of Deer, Elk, Caribou, Rocky Mountain Sheep and Goats, etc. *Fine Geodes* of many varieties—order a few *beauties* for your cabinet. I also have a few sets of Illinois Geological Reports, (Vols. 1 to 8) complete and elegantly illustrated. This magnificent work is now becoming extremely rare, and will soon be beyond reach. Send two stamps for catalog, or with letters of inquiry. Reference, all prominent Scientists or Institutions throughout the country. CHAS. K. WORTHEN, Naturalist, Taxidermist and Dealer, Warsaw, Ill., U. S. A. Established in 1873.

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During the year 1895 I sold nearly 809 pounds of Compound and have filled over 400 orders. Have advertised in nine papers during the year, one of which has a circulation of 18,000 and yet from carefully recorded returns I can safely say that the NATURAL SCIENCE NEWS is the best Advertising Medium of its kind in America. From advertisements in its columns I have received orders from every State and Territory in the Union, from all the British Provinces in North America and from Mexico and Central America. I can conscientiously recommend the columns of the NATURAL SCIENCE NEWS above all other periodicals and papers as a far reaching and reliable advertising medium.

MORRIS GIBBS, M. D., Kalamazoo, Mich.

An Easter Edition

OF 25000 COPIES OF THE

Natural Science News

Will be printed during the latter part of March and mailed not later than April 10th.

A copy will be mailed to every know Naturalist and Curio Collector in in America and to over 1000 selected live ones in Foreign countries.

ADVERTISING RATES will be advanced for this Easter edition as follows:

WANT, EXCHANGES and FOR SALE Notices will cost **50cts per 35 words**, 1c per each additional word, each figure counting as a word.

Coupons given with subscriptions will be honored in payment for notices in these columns in the Easter edition at 25cts each.

ADVERTISEMENTS will be taken at,

10 cents per nonpareil line. 12 lines per inch.
120 lines per column. 360 lines per page.

The minimum price for a single advertisement in the Easter edition will be 50c. A 5 line advertiesment or under will cost that amount.

Not to exceed one full page of space will be accepted from any single person or firm.

NO DISCOUNTS will be allowed at this, less than nominal, rate. Hence a

5 line or less advertisement will cost $. 50
12 line (1 inch) advertisement will cost $1 20.
60 line (½ col.) advertisement will cost 6 00.
120 line (1 col.) advertisement will cost 12 00.
180 line (½page) advertisement will cost 18 00.
360 line (1 page) advertisement will cost 36 00.

Cash Must Accompany Order

Unless you have a satisfactory rating with either Dun's or Bradstreet's Commercial Agency, or can give me satisfactory Bank Reference, or have already had sufficient dealings with me to satisfy me of your financial reliability, the cash must accompany your order. If, however, you have either of the above three requirements and your order is for space amounting to over $2.00 I will neither require nor ask for a single cent's pay until I prove to you

1st—By my printer's affidavit that I have issued 25,000 copies of the Easter edition of NATURAL SCIENCE NEWS.

2d—By my P. O. postage receipts that I have mailed at least 20,000 of the number.

Rates to regular advertisers WILL NOT BE ADVANCED. I will not, however, allow them to use more than the *average* number of lines which they agree to use in each issue for the entire year at this heavy loss to myself. Should they wish to increase the size of their regular advertisement, however, they can do so at the regular rate, for this issue, of 10cts per line.

First and Last Pages

Are always considered more desirable by many, although the Publisher knows that *every* page in this issue will be "religiously" read. However, if YOU consider the first or last page preferable and are willing to back your preference with the "price," I will sell the space on these pages as follows:

On the first page: Small "Want, Exchange and For Sale" advs. on FIRST PAGE will cost $1.00 per notice of 35 words or under. Exceeding 35 words, 3 cts per each additional word.

The Last Page will be sold to a single party or firm and will not be divided. My price for the same will be $50 net.

This Easter issue is sure to prove a "howling success" and it is my desire to have YOU "in it" and share in the fruits thereof.

Expecting to hear from **you** at an early date, providing you wish to share in the success of the issue, I remain, as ever

Faithfully,

FRANK H. LATTIN, Publisher, ALBION, N. Y.

Natural Science News.

VOL. I ALBION, N. Y., JANUARY 25, 1896. No. 52

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

TERMS OF SUBSCRIPTION.

PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN, Albion, Orleans Co., N. Y.

Entered at Albion P. O. as 2nd class mail matter

New subscribers to NATURAL SCIENCE NEWS always in demand and during the month of February its publisher will give 50 cents worth of premiums for each new subscriber a present subscriber may send him. This 50 cts. worth of premiums must be selected from the list given on that little circular headed "Lattin will send you a Christmas present," the same as given on the third advertising page made in the *Premium List Supplement* and 10 cts. must be added to cover the mailing expenses of the present. Remember the new subscriber can accept the $1 premium offer of the NATURAL SCIENCE NEWS and will secure all of the perquisites connected with the same and this premium is an additional offer to our part made to present subscribers who will assist in enlarging the subscription list of our little weekly.

All letters and subscriptions received during the past two months have been acknowledged and premiums forwarded. If you have not heard from the one which you mailed or have heard from it through another party, other than "Lattin" please advise him by return mail, addressing plainly and in full, Frank H. Lattin, Albion, Orleans Co., N. Y., and the matter will be investigated.

Nearly 1,000 subscriptions to NATURAL SCIENCE NEWS expiae with this issue—taking into consideration our exceedingly liberal offer made in the "*Premuim List Supplement*" open to everybody and our bid for subscribers, made on this page—we shall expect not only all of our present subscribers to renew their subscriptions during the next thirty days but shall also, ezcept each to send in one or more new subscriptions.

Debis Portlandia in Abundance.

It was on the 18th of August, 1895, a date fresh to my memory as though it had been yesterday, when my brother and I stepped from the train, which had borne us from St. Louis, to this lovely place, Creve Coeur, Mo., a ride of 20 miles.

It is just 10 a. m., and the hot August sun is already forecasting what it is capable of doing later in the day. A few steps bring us to a woodpile, where we arrange our nets and collecting boxes for the day's hunt. I had hardly opened my net when, "There he goes" sounded to my ears. I was not long in giving chase, and in a few moments returned with a beautiful specimen of *Papilo ajax*. Our leggins are soon in place and we're off. First we climb a steep hill which is rather fatiguing work, but nevertheless we move on as we are well aware of the beautiful place which is awaiting us on the summit. Now we have arrived and before us lays a fine open forest. The ground is studded with magnificent flowers and grasses, which to my great regret I am unable to describe as my knowledge of botany is too limited. Exhausted as we are from the climb we take no time to rest, but separate, one taking the east and the other the west side of the ridge.

Working our way northward, I did not notice that we became somewhat far separated, until I heard my name called. Making my way to where the sound came from, I found my brother in hot pursuit of something, what, was not long to be a secret, for when I appeared on the ridge, the words *Debis Portlandia* rang like music to my ears. A few hops, steps and jumps, brought me to his side, when I became fnlly aware of the situation, for here, there, and everywhere were *Debis Portlandia* to be seen. Here was work and we worked, for in a short time our triangles which numbered about 40 were filled, (one in each) with those graceful insects. But there are still more at hand, so taking a piece of newspaper from his pocket, my brother placed it on the ground near a log, he then emptied about fifteen of his triangles on it and went once more to work. Returning to where he left his prize on the paper in a short time, it burst like a thunderstorm from his lips. Going to ascertain the cause, I found his good reason for so doing. A host of black ants, whose nest was not far off, had found their way to the paper and were carrying wings, legs, and bodies in triumph to their home. Not a single one was left untouched. Insects are entomologist's best friends, but in a case of this kind, he would rather see them all, where he would not care to be, and so it was with my brother, but I soon altered his mind by telling him "Plenty more around, come let's have lunch" then starting in for a hearty laugh at his expense, in which he soon joined me. Presently our boxes are from our shoulders and a log near by served as table and chairs. Sandwich in hand, we spoke of what would only interest an enthusiastic entomologist, "the success of the day" and sure enough it was a dandy, *Debis portlandia* at the head, *Papilio ajax, P. asterias, P. troilus, P. philinor, Argynnis cybele, Phiciodes nycteis, P. tharos, Colias philodiee, Pieris protodice, P. rapae, Meganostoma caesonia, Pyrameis cardui, P. atalanta, Terias nicippe*, and not to forget the dainty *Thecla humuli*, were all represented. Having finished our dinner, we once more tried our luck at *Debis* and succeeded in taking 17 more, making the nice little sum of 56. Happy at our success, we turned our steps toward the station, where we arrived in good time for the train, which was to convey us once more to our home.

I wonder if any other reader of NATURAL SCIENCE NEWS, has ever fouud *Debis* in such abundance in one place, if so let us hear from him, or her.

H. SCHWARZ.

Indians of 200 Years Ago.

We have no authentic history of a people inhabitating this country anterior to those who occupied it on the advent of the Europeans, and who are classed under the

general term "Indians." Their history prior to their intimate association with civilized nations is shrouded in mystery, and is transmitted to us in vague and misty legends. That the aborigines were a semi-barbaric race, we have no doubt. Traces of them may be found in the numerous remains of (New York) the counties forts, etc., with which, in this state of Madison, Onondaga, Seneca and others are covered. As they buried with their dead the implements of warfare, chase and the household, their burial grounds are rich in suggestive relics.

As every one knows the position of the Iroquois confederacy, we will not dwell on that point to any extent. This confederacy was composed of the following tribes; the Goneagaonos (Mohawks), situated in the eastern part of the State, the Onayotekanos (Oneidas), the Onundagaonos (Onondagas), the Gwengwehonos (Cayugas), and the Nundawaonos (Senacas), situated in the central and western parts of the State. The origin of the confederacy was not known to Europeans in 1750, but was supposed to exist at the time of the early New England colonies.

Long ago, says an Iroquois tradition, Taounyawatha, the God of the forest and streams came down from his home in the clouds to bestow good gifts upon the people. He chose for his habitation a beautiful spot on the Teonto (Cross) Lake, where he built him a cabin and married a beautiful girl of the Onondagas, by whom he had a beautiful daughter whom he tenderly loved. He was so wise that he was named Hiawatha, meaning a wise man. While Hiawatha was living quietly among his people, they were attacked by a very strong and powerful enemy from the north, who created terrible havoc in the villages and murdered the men and women without mercy. In their extremity they looked to Hiawatha, who, after thoughtful contemplation, advised them to have a grand council of all the tribes that could be gathered together, "for," said he, "our safety is not alone in the club and arrow, but in wise council." This council was supposed to be held on the east bank of Ohnentaha (Onondaga) Lake, on the high ground where the village of Liverpool now stands. There was a vast assembly of chiefs, men, women and children, and although the council fire had been burning three days, they still waited the presence of Hiawatha. At last messengers were dispatched and they found him troubled with melancholly forbodings of ill-fortune. He had resolved not to attend the council by reason of his distress of mind, but he yielded to their entreaties and set out with his daughter to join the waiting throng. The white canoe in which the venerable Hiawatha made his journey by water, and which was regarded by the people with almost as much veneration as himself, glided silently down the deep waters of the Seneca, through the narrow outlet and onto the placid Onondaga, and as it appeared in veiw, the assembled multitude welcomed their chief with a glad shout. As he ascended the steep bank and approached with measured tread the council ground, a loud sound was heard, like a rushing mighty wind. Instantly all eyes were turned upward and beheld a mass of cloudy darkness rapidly descending into their midst, and increasing in size and velocity as it approached. All sought safety in flight save Hiawatha and his lovely daughter, who calmly awaited the impending calamity, the former having uncovered his silvery head. With a mighty swoop a huge bird, with long, distended wings, descended and crushed the cherished girl to the earth, destroying in her remains every resemblance of a human being, and perishing itself in the awful collision.

The warriors cautiously returned to view the dismal spectacle. The bird was covered with a beautiful white plumage and each warrior took a feather to adorn his crown; and forever afterward the Indians used the plumes of the white heron as their war head-dress.

Hiawatha was disconsolate. He prostrated himself upon the ground and refused to be comforted for three days and nights. At length, however, he ate some of the delicious food offered him, and arose and took his place in the vast council. At the conclusion of the debate, Hiawatha proposed that the council be postponed one day, that they might weigh well the words that had been spoken. The following day the council again assembled and mid breathless silence, the sage councilor arose and thus addressed them:—

"FRIENDS AND BROTHERS, you are members of many tribes and nations. You have come here a great distance from your homes to promote one common interest, which is to provide for mutual safety, and it shall be accomplished. To oppose these hordes of northern foes by tribes, singly and alone, would end in our utter destruction: we can make no progress in that way; we must unite ourselves into one band of brothers. Our warriors, united, could surely repel these rude invaders and drive them from our borders. This must be done and then we shall be safe.

"You, the GANEAGAONOS, sitting under the shadow of the 'great tree' whose roots sink deep into the earth, and whose branches spread over a vast country, shall be the first nation, because you are warlike and mighty.

"And you, ONAYOTEKANOS, a people who recline your bodies against tne 'everlasting stone' that cannot be moved, shall be the second nation, because you give wise counsel in peace and war.

"And you, ONUNDAGAONOS, who have your habitation near the 'great mountain,' and are overshadowed by its crags, shall be the third nation, because you are mighty in war and gifted in speech.

"And you, GWENGWEHONOS, a people whose habitation is the dark forest, and whose home is everywhere, shall be the fourth nation, because of your superior cunning in hunting and fishing.

"And you, NUNDAWAONOS, a people who live in the open country, and possess much wisdom, shall be the fifth nation, because you understand better the art of raising corn and beans and making cabins.

"And you five great and powerful nations must unite, and be as one nation, and no foe shall be able to disturb or conquer you, Brothers, if we unite and be as one nation, the Great Spirit will smile upon us and we shall be free and happy; but if we remain as we are, we shall be enslaved, ruined and shall perish forever."

The council was adjourned one day to give time to consider this speech. Assembling next day, the wisdom of the proposition was unanimously conceded, and then and there was formed the great confederacy of the Iroquois, which has never been effectually broken.

As Hiawatha had accomplished his mission on earth, he prepared to ascend, and as the multitude was about to disband, he made a short speech, and as his voice died away, sweet sounds from the air was heard, and while the assemblage was charmed with celestial melody, Hiawatha was seen to rise

in mid air, seated in his white canoe, the melody becoming louder and purer as he rose until the clouds shut out the wonderful sight and the melodious sounds gradually becoming fainter and fainter, ceased.—Mad. Co. History.

Each Indian had his guardian, MANITOU, to whom he looked for counsel, guidance and protection. These spiritual allies, says Parkam, were gained as follows:

At the age of 14 or 15, the Indian boy blackens his face, retires to some solitary spot and remains for days without food. His sleep is haunted by visions of different objects, and the one which most often appears is to be his Manitou; if an eagle or a bear is in his vision, he is to he a warrior; a wolf is the sign of a successful hunter; a serpent foretells the future medicine man. The young man then returns, wearing about him some part of the object of his dreams, as a feather, a bone, a tuft of hair or a snake skin. In modern language this is knowu as his medicine. The Indian yields to it a sort of worship, propitates it with offerings of tobacco, etc., thanks it in prosperity and upbraids it in disaster. If his medicine fails to bring to him the desired success he will sometimes throw it away and adopt another.

The points of the compass and the winds are also Manitou. There was a Summer-Maker and a Winter-Maker, and the latter was kept at bay by throwing firebrands into the air. The hunter sought to propitate the game he wished to kill, and was often known to address a wounded bear in a long, apologetic harangue. This was also true of fish, which were addressed every evening from the fishing camp by one of the party chosen for that purpose, who exhorted them to take courage and be caught, assuring them that the greatest respect would be shown to their homes. This harangue, which took place after the evening meal, was made in solemn form; while it lasted, the whole party except the speaker was required to lie motionless around the camp fire.

They reduced war to a science, and all their movements were directed in one system and by one body. Spies were always sent ahead to explore a hostile country before attacking, and while in camp they used the most stringent methods to guard against attack. No matter if they far out-numbered an opposing force, they never neglected the use of strategy. Although they used horrible measures to torture their prisoners, reports of such actions have been grossly exaggerated. To illustrate their endurance of torture, the following is printed:

"In 1638, a party of 100 Iroquois was met in the forest by 309 Hurons and defeated. Among the prisoners to be put to death by the Hurons was a young Onayotekaono chief, who was first put to torture. On the scaffold where he was burning he wrought himself into a fury which seemed insensible to pain. Thinking him nearly spent, his tormentors scalped him, when to their amazement he leaped up, snatched the fire brands that had been the instruments of his torture, and drove the screeching crowd away from the scaffold and held them all at bay, while they pelted him with sticks and stones and showers of live coals from below. At last he made a miss-step and fell through to the ground, when they seized him and threw him into the fire. He instantly leaped out, covered with blood and cinders, and rushed upon them with a blazing brand in each hand. The crowd gave way and ran toward the village as if to set it on fire. They threw a pole across the trail in front of him and tripped him, when they all fell upon him and chopped off his hands and feet and again threw him into the fire. He rolled himself out, and crawled forward on his elbows and knees, glaring at them with such unutterable ferocity that they recoiled once more, till, seeing that he was helpless, they threw themselves upon him and cut off his head."

There were marked physical and tempermental differences between the various Indian tribes of this country. The Iroquois were erect and commanding in figure; they were reserved, deliberate and cunning. The prairie Indians are more social and excitable, and not as apt to be diseased.

The western tribes, as the Pawnees, Sioux, Apaches and Nez Perces and others, who subsist mostly upon the results of the chase, are a much better fed and larger race than those who lived on food raised by themselves and such game as they could readily shoot with the bow and arrow, on foot: thus the Indian who hunts on horseback with a troop of tribesmen around him must be a different being from the solitary deer-stalker who wanders about in the forest, dependiug upon his single arm for subsistance for himself and his family.

It is arrested by good authorities that had the Europeans never discovered America, the Iroquois would have conquered every tribe east of the Mississippi and south of the St. Lawrence.

Of the Iroquois, the Nundawaonos, who occupied the most fertile portion of the country, were the leaders in cultivating the soil. They had immense orchards of apples, pears, peaches and other fruits. When General Sullivan passed through their country in the fall of 1779—100 years ago,—he reported that "the Indian town of GENESEE, contained 128 houses, mostly large and substantial. It was beautifully situated, encircled by a clear flat extending several miles, over which fields of corn were waving, together with every kind of vegetable that could be conceived of. The dwellings differed in size and shape and were generally built with much labor and care. They were about thirty feet high and of the same area, but some were much larger—240 feet long and of the same breadth and height as the others. They were covered with bark, overlapping like shingles, and held in place by small poles which were fastened to the frame by strings made from a tough bark."

With the Iroquois the main article of food was fish, and corn cooked in many different ways. This, cooked with beans of many different colors was a highly esteemed dish. Their bread was made from corn and was a daily article of food. Berries and fruits were sometimes dried for winter. Venison was a luxury found only at feasts.

The Iroquois had five stated annual festivals, each conducted according to the special event commemorated.

The first was held in the spring, after the close of the sugar making season, in gratitude of the amount of sugar they had been permitted to make. It was closed with dancing, singing and games.

The second was held immediately after corn planting, when thanks was rendered for the favorable seed time, and the Great Spirit evoked to give it a healthy growth.

The third, called the Corn Dance, was held when the corn was ready for use, and thanks were rendered for that valuable gift which was prepared in great quantity and in many different ways.

Songs and dances entered largely into the ceremonies of this occasion, which were closed by the famous Succotash Dance. The pipe of peace was usually smoked by tne head men or each nation.

The fourth was given in honor of the corn harvest. Three days were allotted to each of the preceding festivals.

The last and most important festival of the year was held in January or February in honor of the return of the hunters laden with meat and skins, aud was celebrated with great pomp and ceremony. This festival lasted many days, according to the opinion of the managers.

The men wore upon their shoulders a robe of deer or bear skin with the fur next their bodies, the outside being covered with a variety of painted designs. They as well as the women adorned their necks and arms with beads and ornaments of exquisite workmanship. Around villages was a stockade of palisades, from ten to fifteen feet high, to protect them from enemies. Considering the tools they had with which to build these stockades, they would almost compare with the pyramids of Egypt. Traces of them may be seen to this day, in the shape of a deep trench inside of which relics are found.

When an Indian died, they placed the body in its grave, wrapped in all the blankets and skins possessed by the dead while living. Beside the body was placed a kettle of trinkets, some food, a pipe and some weapons. The burial grounds of their forefathers were guarded with reverential awe, and were defended with vain determination.

The names of their months are these: Cuerano, Weerhemska, Heemskan, Onertacka, Onertack, Hagarert, Jakouveratta, Hatterhonagat, Genhendasta, Digoienjattha. Of January and December they take no note, being of no use to them.

They believed that the spirits of the dead visited their neighborhood during the hours of darkness, and that they could distinguish their voices in the sighing of the wind in the forest, or in the cry of wild beasts as they stealthily approached the village in search of food. When a panther's shriek was heard, they recognized the voice of a departed relative, full of warning and weird omens: when the gentle sobbing of the wind in the pine trees was heard, they recognized the voice of a departed chief, full of upbraiding and reproach. In the merry singing of the birds they heard the voices of the happy dead, telling them not to weep for those who rested amid the beautiful flowers of the Spirit Land.

Alas, Alas! the Indian is gone,
A mortal of the past is he;
He never will come to reclaim his own
From the mountain to the sea.

—*Bert C. Ames.*

Gold Beneath the Lava.

The great lava flow covers a section of country in Idaho 400 miles in length by forty to sixty miles in width. Its lies in the southeastern part of the State, on and along the course of the Snake River, and mostly on the north side of that stream.

After flooding the great plain lying to the southward, the lava turned and flowed backward to the north. There it flowed into the mouths of the valleys lying between the foot hills, filling all the streams that flowed out toward the south. The streams thus checked and dammed presently found passages beneath the porous lava, and now flow under it from thirty to fifty miles, to reappear as large springs or to burst forth in cascades and tumble down the walls of basalt that border Snake River. On the line of the back flow, up toward the northern foot hills, lies the most ragged and forbidding portion of the great lava plain.

These lava flows covered rivers, creeks, canyons, valleys, and even basin regions filled with low hills. Many of the streams, gulches, flats and basins in the country surrounding the lava-covered section on all sides have been wonderfully rich in gold, wherefore it is reasonable to suppose that many of those covered by the lava are also rich in the same way.

The Snake or Shoshone forms the great center of the Idaho river system. It has a course of 850 miles within the State, and, with its branches, drains nearly the whole country. The Clearwater, the Salmon, the Weiser, the Fayette, the Boise, the Lemhi, the Owyhee, and other rivers, tributary to the Snake, were wonderfully rich in gold. The Yankee fork of the Salmon and many other creeks were exceeding rich in the yellow metal. Rich placiers were found in the streams that formed the Boise River in 1862; in the year following in the tributaries of the Owyhee and many other places. The valleys of the Weiser and Fayette, constituting what was known as the "Boise Basin," was one of the richest placer regions ever found.

What are called basins in Idaho are not bowl-shaped depressions, as many suppose, but are sections of low country surrounded by large mountains. Within the basins are many hills and creeks. The Florence Basin was astonishingly rich and many others were little behind it as producers. Prior to 1868 these basins and other surface diggings in little flats and on gulches produced $45,000,000. Up to 1873, by which time most of the famous placers had been worked, the yield from the surface diggings amounted to $75,000,000. Then began the rich discoveries in quartz, but placier mining is still continued and occasionally rich finds are made.

From what has been said of the rich deposits of gold in the basins, valleys, gulches, flats and streams of Idaho, it is reasonable to suppose that under the great lava flow covering an immense area—not less than 20,000 square miles—in the heart of the auriferous region, must lie many exceeding rich dedeposits of gold.

The gold places of both California and Idaho are countless ages older than the lava flows. In California the channels of the ancient rivers beneath the lava are much richer than those of the modern rivers and places. This is because the channels of the ancient rivers had served as bedrock sluices for untold ages before the disturbing lava flows began. The present rivers of California received the greater part of their gold by their cutting across and carrying away great sections of the rich channels of the ancient rivers.—*Dan De Quille in the Engineering and Mining Journal.*

Natural Science News.

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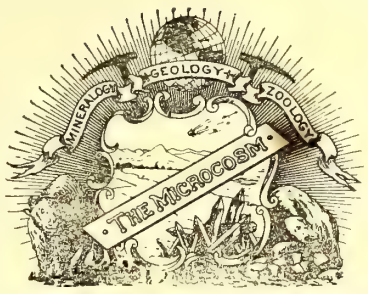

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	Price per Egg Reg. price	Rem. price
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Leach's Petrel 1-1	20	10
Am. White Pelican 1 3	35	17
White Ibis 1-3	35	16
Chacalaca 1-3	75	18
Redwing Blackbird 1-4	2	1
Vesper Sparrow 1-4	5	2
Lark Sparrow 1-3	5	3
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Pied-billed Grebe	$ 10	$ 5
Ring-billed Gull	20	14
Am. Herring Gull	20	8
Common Tern	8	5
Least Bittern	20	8
Spotted Sandpiper	15	6
Killdeer	20	9
Bobwhite	10	5
Valley Quail	20	9
Little Blue Heron	12	6
Chacalaca	75	17
Turkey Buzzard	75	34
Red-shouldered Hawk	35	20
Am. Long-eared Owl	35	20
Belted Kingfisher	20	8
Florida Blue Jay	35	12
Brewers Blackbird	3	1
House Finch	5	2
Western Goldfinch	10	4
Vesper Sparrow	5	2
Painted Bunting	10	4
Summer Tanager	25	10
Bank Swallow	3	1
Yellow Warbler	6	3
Mockingbird	5	3
Brown Thrasher	3	1
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Parkman's Wren	15	5
Tufted Tit	35	15

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Musk Turtle	$ 15	$ 4
Snapping Turtle	15	6
Alligator	35	20
All three for only		$5

SHOWY SHELLS.

*East India Clams, large	$1 00	$ 55
*Polished Conch, large	50	30
*Fasciolaria princeps, fine	1 50	45
*Fulgur perversa, large	50	20
Goldmouth	25	7
Turks-cap	35	21
Green Snail	35	21
Marbled Cone	35	14
Silver-lip	10	5
Pearl Trochus	25	12
Green Ear, polished	40	18
Mitre Shell	15	8
Crown Shell, extra fine	45	20
Orange Egg Shell	10	4
Lettered Olive	10	1
Mammoth Tusk Shell	35	13
Lightning Shell, ½ doz	15	4
Louse Trivia, ½ doz	30	10
Worm Shell	5	1
Bleeding-tooth shell	10	2
Tiger Cowry	25	9
Helvola Cowry	10	3
Helix fidelis	20	7
" lactea	10	3
" pomatia, large	15	5
" pisania	10	2
" arborustorum	10	2
Orthalicus fasciata	35	12
" melanocheilus	35	14
Liguus fasciata	20	8
Sun and Moon Shell	40	20
Valve of "Mother of Pearl" shell	35	20
" " Pecten or Scallop	10	2
" " Sun Shell	10	2

This entire lot of shells list at $10.05 or at my REMOVAL SALE prices at $4.20. At any time before March 1st I will deliver the entire lot in Albion, F. O. B. for only $3.00

Those marked (*) must go by freight or express at purchaser's expense always.

INSTRUMENTS and SUPPLIES.

TAXIDERMISTS.

	Reg. price	Rem. price
Brush for cleaning feathers	$ 30	$ 18
Pocket wire cutters	35	22
Tweezers, best	25	18
Pint arsenical soap	45	30
Box bird lime	50	28
Two lbs arsenic	30	18
Two lbs alum	30	18
Two lbs preservative	40	20
Tow, fine, per lb	15	9
Bottle of Tanning Liquor	1 00	40

Everything except first three items must go by express at your expense. I will deliver the whole lot in Albion. F. O. B. for $2.00.

OOLOGISTS.

Roll of wool-cotton for lining trays Name your choice of colors	$ 90	$ 50
Datas, assorted, 4 styles, 100	20	12
Blowpipe	25	14
Embryo hook	15	8
Embryo hook (set of 3 and engraved handle)	75	56
Book of tissue paper for patching, assorted colors	10	5
Reed caliper square, nickle plated, sliding jaws	1 00	70

I will deliver this entire lot prepaid for only $2.00.

CURIOS.

Scorpion in box	$ 35	$ 20
Cassia beans, package	10	3
Red sea beans, ½ doz	15	5
Yellow sea beans, ½ doz	20	7
Black sea beans, ½ doz	20	6
Brown banded sea bean ea	5	2
Striped sea bean ea	10	3
Liver bean ea	10	4
Mimosa seeds, package	10	2
Chinese Horn nut	10	3
Bottle nut	10	5
Gun-flint, from site of old Ft. Pitt	15	7
S. A. Porcupine Quill, 6 in	20	6
Chinese cash coin	5	3
Broken-bank bill	15	7
Extra fine pair of polished buffalo horns	5 00	2 13
Resurrection plant	15	6
Tapa cloth, made by natives of South Islands, curiously figured and strong	25	7
Sarpindus berries, semi transparent, come in clusters like grapes, will last forever	25	11
Acorn barnacle, single	10	3
" " double	25	8
Skin of 2ft alligator, good for mounting	2 50	94
Hermit crab in shell	75	20
Fiddler crab	15	5
Porcupine fish	45	24
" "	1 50	60
Butterfly octopus, in alcohol	3 00	90
Sucker from Giant Octopus, in alcohol	50	23
Saw-fish saw, 8 inches	35	16
" " 3 feet, fine	5 00	2 35
Tooth of sperm whale	1 00	40
Alligator teeth, 3 assorted	40	10
Marine algæ on card, 6x4 in, *, no two alike	30	10

This entire lot lists at $24.00 or at REMOVAL SALE prices at $9.58. Before March 1st I will deliver it in Albion, F. O. B. for only $8.00.

NOVELTIES.

	Reg. price	Rem. price
Chameleon in alcohol	$ 35	$ 10
Yucca palm pin-cushion	25	9
Penholder made from tail of King Crab	15	9
Souvenir spoon, bowl of cardium, handle of tail of King Crab, 5 in.	25	17
Irridescent pottery from Patzcuaro, Mexico; a lost art revived, fine 2½ and 3 in. pieces	15	11
Flower picture, (oil painting) in venetian pearl snail shell frame	50	32

This entire lot lists at $1.75 or at Removal Sale prices 88 cents. At any time before March 1st I will deliver the entire lot in Albion, F. O. B., for only 62 cents.

MINERALS.

	Reg. price	Rem. price
Large Brazilian agates, polished	$ 75	$ 39
Fine polished malachite	50	27
" " bloodstone	25	13
" " moss agate	35	16
½ doz. small polished agates, all different	50	23
Quartz crystals	10-50	4-21
" " fine, group	1 25	57
Chiastolite crystal	15	5
Electric stone	25	11
Gold-bearing quartz, Mont	10	6
Green opal, Wash	15	9
Rubelite, Calif	25	14
Lodestone, Ark	15	7
Sphalerite, Mo	25	9
Bournite, Mo	10	4
Limonite, Va	15	5
Geyserite, Yellowstone Park, strangely streaked and variegated	50	22
Native sulphur, Calif	25	10
Asbestus, Penn	15	6
Fine quartz, geode formation	10	3
Magnesite, Greece	20	8
Iceland spar, Tex	10-50	6-27
Celestite, Penn	10	6
Meteorite, Ariz	25	13
Carborundum, N. Y.	25	13

This lot of fine minerals lists at $8.15, or at Removal Sale prices at $3.84. At any time before March 1st I will deliver the entire lot in Albion, F. O. B. for only $2.90.

FOSSILS.

Athyris spiriferoides	$ 15	$ 6
Atrypa hystrix	25	11
Orthis cyclas	30	14
" biforata	10	4
" lencosia	10	4
Spirifer granulifera	30	16
" striatus	15	6
Rhynchonela capax	10	4
Athyris subtilita	10	2
Ortherceras dusseri	25	9
Nucleocrinus vermuilli	1 00	41
Trigonocarpus triloculare	25	9
Anchyrocrinus bulbosus	50	23
Pentremites godonii	15	6
Scaphites nodosus	25	9
Fossil Shark's tooth	10	4
" Fern, fine	50	27
Fossil Coral	25	7

This entire lot lists at $4.80 or at REMOVAL sale price at $2.02. At any time before March 1st I will send the entire lot for $1.85 *prepaid.*

STARFISH, ETC.

Astrophyton Basket-fish	$1 00	$ 38
Archaster, Deep-Sea Star	1 25	30
Benthopecton, Spiney Star	50	23
Asterias, Atlantic Star	35	16
Cidaris, Club-spined Urchin	75	27
Echinus, Deep-sea Hedgehog	75	23
Laganum, Phillipine Urchin	75	17
Arbacia, Florida Hedgehog	30	11
Giant Calif. Urchin	1 00	39
" Bahama Sea-beaver	3 00	97

This entire lot of Echinoderms lists at $9.65, or at REMOVAL SALE prices $3.32. At any time before March 1st I will deliver them in Albion, F. O. B. for only $2.20.

ARROW and SPEARHEADS.

Good Arrowpoint, Ky.	$ 10	$ 4
Good Spearhead, Ky	20	8
Serrated Arrowpoint, Ky	25	14
Good Arrowpoint, Ind	10	05
Good Spearhead, Ind	20	9
Serrated Arrowpoint, Ind	20	10
Drill, Ind	25	13

This entire lot for only 55cts., *prepaid.*

POSTAGE STAMPS.

U. S. 3c., Rose, 1856	$ 01
" 3c., (Locomotive) Blue, 1869	02
" 3c., Green, 1872	01
" 3c., (Embossed), Rose, 1868	02
" 8c., (Sherman) Lilac, 1890	04
" 3c., (Envelope) Pink, 1864	05
" 2c., (Internal rev.) Orange, 1866	01
" 2c., (Proprietary) Blue, 1865	01
" 2c., (Playing card) Blue, 1865	15

This entire lot of U. S. stamps for only 15cts.

*MOUNTED BIRDS.

Blue Jay, on perch	$1 60	$ 70
Cedar Waxwing, on perch	1 40	60
Willow Ptarmigan, on stand	3 50	2 25
Cotinga (S. American)	5 00	2 28

*All mounted birds by EXPRESS at purchaser's expense. This entire lot sent to one address for *only* $5.

ERNEST H. SHORT, ALBION, N. Y.

NATURAL SCIENCE NEWS

VOL. II. No. 1-53. ALBION, N. Y., FEBRUARY 1, 1896. Weekly, $1.00 a Year

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

FOR SALE OR EXCHANGE;—Eggs in sets or singles of this locality for sets of others. Send list when answering. W. H. CONNERY, 202½ New Houston St., Savannah. Ga.

I HAVE complete set of Insect Life to exchange for Coues' Key, Ridgway's Manual, Gosses' Birds of Kansas, Davies' Methods in Taxidermy or offers. H. G. HOSKIN, Burlington, Colo.

WANTED:—A second-hand copy of Maynard's Butterflies of New England states, Packard's Guide to the Study of Insects. Send condition and lowest cash price. J. S. KNOX, Silver Creek, N.Y,

FOSSIL CORALS CHEAP.—Solid *Monticulipora mammulata;* branch rough, *Monticulipora ramosa;* branch smooth, *Monticulipora onecalti;* polyp, *Streptelasma corniculum,* Full geological data. All four postpaid 25c, any two 16c, one 10c, or all small (but fine) size, 1x1 in. only 15c. OTTO GRADY, Ludlow, Ky.

HIGH CLASS White Plymouth Rock fowls and eggs for hatching to exchange for fine sets of desirable eggs. W. J. B. WILLIAMS, Holland Patent, N. Y.

BOOKS! BOOKS! BOOKS!—Binding for Naturalists at reduced rates. Art works with special designed covers, Commercial Ruling and artistic printing on short notice. Try us. ADOLPH LAUX, Book-binder, Lockport, N. Y. 53-1t

WANTED:—Air brush, complete, in perfect order. Address H. FRYETT, 264 Chestnut St., E. Liverpool, Ohio.

WANTED:—Collections of eggs in sets or singles, Persons having such for sale cheap send list and lowest price. Southern eggs in sets to exchange in the summer. DR. M, T CLECKLY, 457 Greene St., Augusta, Ga. Fo 2t, 53-2t

TO EXCHANGE:—Minerals, fossils and insects for same not in my collection would prefer butterflies and moths from southern states. Send lists. JOHN S. KNOX, Silver Creek, N, Y.

NOTICE:—Fourteen varieties of tickets from the World's Fair given in exchange for each curiosity (Natural History) worth 25c if in good condition. World's Fair chair canes at 35c each. C. FOX, 525 West 61st St., (Sta. O.) Chicago, Ill.

FOR 10 DAYS I offer 25c specimen of Labradorite at 11c prepaid, Shark's Tooth (not fossil) 5c each, 6 for 25c; Florida or Cuban Tree Snails regular price 25c, at 8c each; one of each for 15c. Address ERNEST H. SHORT, Albion, N. Y.

NOTICE:—I have a kitten (alcoholic specimen) with two distinct bodies joined to one head, 8 legs and 2 tails. Preserved perfectly. Price $2.00. Address ERNEST H. SHORT, Albion, N. Y.

SHARK'S Jaw, upper and lower sets of teeth all in; finely cleaned. Price $2.10 prepaid. ERNEST H. SHORT, Albion, N. Y.

FOR SALE OR EXCHANGE:—Baush & Lomb Histological set of Microscope slides in mahogany case. 3 slides missing, cost $21; Abbe Condenser for B. L. microscope cost $8; Turn Table for making slides, cost $2.50; will exchange for U. S. or B. N. A. stamps not in my collection of equal value or will sell for $25, all new, never been used. Address W. H. COLBURN, Box 696. Lowell, Mass.

KANSAS EGGS:—Collection and duplicate worth about $18.00 for Album and Stamps, minerals. shells. fossils or offers. Fine lot for exchanging. CARL E. HOUDYSHEL. Holton. Kansas.

FOR SALE:—I have a few singles of Oregon birds eggs with data which I wish to dispose of, and will sell cheap at the following prices: A. O. U. No's 214, 05; 221, 04; 263, 08; 309, 25; 413, 05; 447, 03; 475, 08; 497, 02; 498, 01; 501b, 03; 510, 01; 735b, 18; 761a, 05. First come, first served. ROBT. W. HAINES, Baker City, Oregon.

FOR SALE:—A fine collection of crystalized minerals, consisting of a variety of agates, carnelians, onyx and many unclassified; many polished, aggregating one and a half bushels. Cheap if all taken. FRIAR TERBUSH, Racine, Wis.

PUBLICATIONS wanted: During February I will allow the following prices for numbers named of the following publications in exchange. *The Auk* Vol. I ('84) and II ('85) any number and Vol. IV ('87), No. 2 (April), 75 cts each; *Nidiologist*, Feb. '94 and April '94 at 10 cts each: OOLOGIST for Jan. '95 at 5cts each.
FRANK H. LATTIN, Albion, N. Y.

FOR SALE or EXCHANGE.—Tarpon rod with two tips, Von Hofe reel, Springfield rifle and bayonet. Best offer. Want 12 or 16 ga Hammerless for 10 ga. Ithaca Hammerless. H. I. BENEDICT. 18 Main St., Lockport, N. Y. 53-2t

WANTED:—A 1 sets of 190, 214, 261, 263, 273, 360, 387, 388, 393, 394, 412, 619, 627 and many others in series. Offer sets 16, 30, 120c, 49, 51, 127, 710, 758 &c. FRANK HARRIS, La Crescent, Minn.

SKINS and MOUNTED BIRDS, for sale or will give for good exchange in desirable sets or singles with complete data, or ornithological publications. Correspondence solicited. A. P. and D. J. SIMMONS. 611 Jacob St., Troy, N. Y. O.

FOR EXCHANGE.—Parties having any of the following goods will do well to write me for particulars on good exchange. I can offer Coues' "Key," Packard's "Guide to the Study of Insects," "H. W. Bates on the River Amazon," Baty's "How to Hunt and Trap," "Shooting on the Wing," Ridgeway's "Manual," and Davie's "Methods in the Art of Taxidermy." Must be in good condition. Can use Bicycle, Winchester Shotgun or Oological Instruments. GUY K. BARNES, Strawberry Point, Iowa.

WANTED.—Fox squirrel in meat, head of antelope and mountain sheep and first class skins of herons. Exchange or cash if cheap. F. M. RICHARDS, Farmington, Maine.

FOR EXCHANGE. - I have a large collection of sets and singles, some rare, which I will exchange for minerals, shells, curios, or sets Lists sent for yours. W. A. HORROM, Atlanta, Ill. 52-2t

TO EXCHANGE for sets. tanning process stops express and freight expense, sample of tanning for stamp, guarantee it to do the very best of work. ALMON E. KIBBE, Mayville, N. Y. 52-2t

WANTED.—Perfect diurnal lepidoptera from the north-western, western and south-western states, in papers. Offer fine examples of exotics. Entomological addresses especially desired. LEVI W. MENGEL, Reading, Pa. 52-2t.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds.," EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, Dennis, Mass. 51-25t

TO EXCHANGE.—Specimens of Barite with Quartz Crystals, from Cheshire Co. for other minerals. HARRY LATHAM, 84 Camp St., New Britain, Conn. 52-2t

FOR SALE:—Chinese coins, 2c: Chinese lottery ticket, 2c: Chinese Newspaper, 3c; Japanese Oblong Coins, 5c; Fine Specimens of Calcareous Tufa, 10c: 3 different Cal. eggs, 5c; 5 correctly named Cal. shells, 10c: Sand Dollars, 4c: Chalcedonyx, 5c. All specimens sent postpaid. Send 2c for a list of fine sets of eggs and curios, shells, etc., I have for sale. W. H. HILLER, 147 W. 23d St., Los Angeles, Cal. 51-3t

WANTED.—Shot gun and World typewriter. Will give opals or minerals. Would like a few Columbian stamps in exchange. ROBERT BURNHAM, Dennis, Mass. 52-2t.

SOUTHERN Bird or mammal skins for others, medical books, mammals on all subjects, for skins or museum specimens. J. J. WIRZ, Taxidermist, Augusta, Ga. 52-2t

"AUKS" Wanted.—I will allow 30c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms Nos. 1 and 2 of NATURAL SCIENCE NEWS at 10c each and the following No's of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete, clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

TO EXCHANGE.— An International Type-Writer, almost new, cost $100, for best offer A. M. EDDY, Albion. N. Y.

ERNEST H. SHORT,

ALBION, N. Y.

Successor to the Retail Mail and Catalogue Business of Frank H. Lattin.

I have purchased and control all of the Glass Eyes, Oologist's and Taxidermist's instruments and supplies. from the stock of FRANK H. LATTIN of this place. All orders to receive prompt attention, should be sent directly to me. Eyes for Alligator (any size) Wild Cat, Fox, Deer, etc., always in stock. Also Climbing Irons, Books on Natural History, etc. Birds and mammals mounted in A 1 shape. Give me a trial.

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

FLORIDA SHELLS

In reach of all. Cheaper than the cheapest. Now is the time to start a collection.

1. Strombus alatus, 2 to 3½ inches..... 4c
2. Fulgur perversus, 3 to 8 inch 6
3. Fasciolaria tulipa, 2 to 6 inch..... 8
4. " distans, 1 to 3 inches..... 4
5. " filamentosa, 1 to 3 inch..... 2
6. Cardium magnum, 3½ to 4 inches..... 6
7. " muricatum, 1½ inch single valves 1
8. " serratium, 1 to 2½ inch..... 3
9. Arca ponderosa, 2 to 3 inch..... 3
10. " noæ, 1 to 4 inch..... 3
11. " floridanum, 2 to 2½ inch..... 3
12. Cytherea (callista) gigantea, 3 to 5 inch...10
13. " " maculata, 1 to 2½ inch 6
14. Natica duplicata, 1 to 3 inch..... 2
15. Chama Arcinella. 1 to 2 inch..... 5
16. Dosinia discus, 2 to 4 inch..... 5
17. Pholas costatus, 3 to 6 inch, double valve...15
18. Murex pomum, 1 to 3 inch..... 3
19. " salleanus, 1 to 3 inch 5
20. Pyrula papyratia, 3 to 5 inch..... 8
21. Pecten exasperatus, ½ to 3 inch, single..... 1
22. Conus Floridanus, ¾ to 1 inch..... 2
23. " proteus, 1 to 3 inch.....10
24. Pinna muricata, 4 to 10 inch 8
25. Lucina edentula, 1½ to 3 inch. single 2
26. Cancellaria carolinensis, 1 to 1½ inch..... 3
27. Oliva litterata, 1 to 2½ 2
28. Anomia ephippium, 1 to 2½ inch..... 1
29. Melongena subcoronata, 2 to 6 inch..... 8
30. Cerithium eburnum, 1 to 1½ inch 3
31. Turritella, 1 to 1½ inch..... 2
32. Tellina, ½ inch..... 1
33. Marginella, ¼ inch..... 2
34. Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans 1
35. Sea beaver.....15
36. Conch spawn ribbon, 18 inch to 2 feet.....20
37. Skate eggs..... 5
38. Rose coral, shaped like a rose 10
39. Florida air plants.....10
40. Tarpon scales..... 2

$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

J. C. Baker successor to **Baker & Hanson**
Myers, Lee Co., Florida.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

R-I-P-A-N-S

ONE GIVES RELIEF.

"Natural Science News is the best Advertising Medium of its Kind in America."

During the year 1895 I sold nearly 809 pounds of Compound and have filled over 400 orders. Have advertised in nine papers during the year, one of which has a circulation of 18,000 and yet from carefully recorded returns I can safely say that the NATURAL SCIENCE NEWS is the best Advertising Medium of its kind in America. From advertisements in its columns I have received orders from every State and Territory in the Union, from all the British Provinces in North America and from Mexico and Central America. I can conscientiously recommend the columns of the NATURAL SCIENCE NEWS above all other periodicals and papers as a far reaching and reliable advertising medium.

MORRIS GIBBS, M. D., Kalamazoo, Mich.

An Easter Edition

OF 25000 COPIES OF THE

Natural Science News

Will be printed during the latter part of March and mailed not later than April 10th.

A copy will be mailed to every know Naturalist and Curio Collector in in America and to over 1000 selected live ones in Foreign countries.

ADVERTISING RATES will be advanced for this Easter edition as follows:

WANT, EXCHANGES and FOR SALE Notices will cost **50cts per 35 words**, 1c per each additional word, each figure counting as a word.

Coupons given with subscriptions will be honored in payment for notices in these columns in the Easter edition at 25cts each.

ADVERTISEMENTS will be taken at,

10 cents per nonpareil line. 12 lines per inch.
120 lines per column. 360 lines per page.

The minimum price for a single advertisement in the Easter edition will be 50c. A 5 line advertiesment or under will cost that amount.

Not to exceed one full page of space will be accepted from any single person or firm.

NO DISCOUNTS will be allowed at this, less than nominal, rate. Hence a

5 line or less advertisement will cost $ 50
12 line (1 inch) advertisement will cost $1 20.
60 line (½ col.) advertisement will cost 6 00.
120 line (1 col.) advertisement will cost 12 00.
180 line (½page) advertisement will cost 18 00.
360 line (1 page) advertisement will cost 36 00.

Cash Must Accompany Order

Unless you have a satisfactory rating with either Dun's or Bradstreet's Commercial Agency, or can give me satisfactory Bank Reference, or have already had sufficient dealings with me to satisfy me of your financial reliability, the cash must accompany your order. If, however, you have either of the above three requirements and your order is for space amounting to over $2.00 I will neither require nor ask for a single cent's pay until I prove to you

1st—By my printer's affidavit that I have issued 25,000 copies of the Easter edition of NATURAL SCIENCE NEWS.

2d—By my P. O. postage receipts that I have mailed at least 20,000 of the number.

Rates to regular advertisers WILL NOT BE ADVANCED. I will not, however, allow them to use more than the *average* number of lines which they agree to use in each issue for the entire year at this heavy loss to myself. Should they wish to increase the size of their regular advertisement, however, they can do so at the regular rate, for this issue, of 10cts per line.

First and Last Pages

Are always considered more desirable by many, although the Publisher knows that *every* page in this issue will be "religiously" read. However, if YOU consider the first or last page preferable and are willing to back your preference with the "price," I will sell the space on these pages as follows:

On the first page: Small "Want, Exchange and For Sale" advs. on FIRST PAGE will cost $1.00 per notice of 35 words or under. Exceeding 35 words, 3 cts per each additional word.

The Last Page will be sold to a single party or firm and will not be divided. My price for the same will be $50 net.

This Easter issue is sure to prove a "howling success" and it is my desire to have YOU "in t" and share in the fruits thereof.

Expecting to hear from **you** at an early date, providing you wish to share in the success of the issue, I remain, as ever

Faithfully,

FRANK H. LATTIN, Publisher, ALBION, N. Y.

Natural Science News.

VOL. II ALBION, N. Y., FEBRUARY 1, 1896. No. 1-53

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

TERMS OF SUBSCRIPTION.

PRICE, ONE DOLLAR A YEAR.

To Foreign Countries in the Universal Postal Union, $1.50, equal to 6 s., or 6 marks, or 8 francs. Single copies, 5 cents each.

Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN, Albion, Orleans Co., N. Y.

Entered at Albion P. O. as 2nd class mail matter

New subscribers to NATURAL SCIENCE NEWS are always in demand and during the month of February its publisher will give 50 cents worth of premiums for each new subscriber a present subscriber may send him. This 50 cents worth of premiums must be selected from the list given on that little circular headed "Lattin will send you a Christmas present." the same as given on the third advertising page of the NATURAL SCIENCE NEWS, No. 46 of Dec. 14th, 10 cents must be added to cover the mailing expenses of the present. Remember the new subscriber can accept the $1 premium offer made in the *Premium List Supplement* and will secure all the perquisites connected with the same and this 50 cents worth of presents is an additional offer on our part made to present subscribers who will assist in enlarging the subscription list of our little weekly.

The Radiata.

The zoological class termed the *radiata* was comparatively unknown until within the past century, and its species were considered to be connecting links between the animal and the vegetable kingdoms, being known as zoophytes; and Linnæus defines them as "composite animals which appear to rank between animals and vegetables; though they are true animals, and possess sensation and voluntary motion."

The radiata are entirely aquatic, and are mostly marine. They are divided into three classes. These are: 1. Polyps—sea anemones, nearly all the corals, etc. 2. Acalephs—jelly fishes, medusæ, Portuguese men-of-war, etc. 3. Echinoderms—sea cucumbers, star fishes, crinoids, etc.

The structural plan of all the polyps is so nearly similar that a single illustration will answer for all, although they differ greatly in size, shape, and minute particulars. Let us suppose an orange with a small portion of the stem end removed, and a hole descending to a little past the center from this end. Now the skinny partitions which, like longitudinal planes, extend through the fruit will divide it into chambers. We must suppose a similar wall surrounding the cavity which runs down from the end of the fruit, but communicating freely with all the inner portions of the orange, through the lower end of this opening. Polyps have but this one orifice, which is the mouth. Into this all the food is taken, and from this all rejected matter is thrown out. The digested food passes from an opening in the lower portion of this cavity or sack into all the chambers of the polyp, and finally into the delicate, hollow tentacles with which the upper part of the body is fringed. This is the general form of life of all the polyps, some of which, like the corals, are stationary, while others are nomadic, and still others are parasites, living in the mouth folds of still larger radiata. The polyps vary quite materially in shape, some being almost saucer-like, others pyramidal, cone-shaped, etc.

In the lower polyps the eggs are formed on all the inner edges of the vertical partitions, and when these are ready for exclusion they drop to the bottom of the digestive sack, whence they pass outward through the mouth. In the higher order of polyps not all of these partitions are fruitful, the limitation increasing as the species rise in organic superiority. Some of the polyps also increase by buds similar to fruit buds, others by subdivision. Polyps may be cut into several pieces, and the majority of these will each become a perfect animal. They vary in size from a foot in diameter to mere microscopic mites.

From what has been said of the growth of these polyps it will be seen that coral insects have too long enjoyed the fellowship of bees, ants, etc., as hardworking creatures, with some knowledge or method of architecture. They produce coral no more ingeniously or laboriously than a fish produces bones, and cannot help it if they would. Coral is only what is left after the death of a whole community—a village of individuals whose bones, not their houses, are fashioned by cunning artisans into such beautiful adornments for our fashionable belles.

The acalephs are perhaps more interesting to the student and naturalist than the polyps. In these we find exemplifications of the curious law of alternate generations. The egg of a butterfly produces a caterpillar, which in turn becomes a chrysalis, and from this the perfect fly is in due time hatched. In some of the jelly fishes different but no less wonderful changes take place, while in others the method of reproduction is similar to that of the budding polyps. In some cases two generations intervene between the parent and a progeny which resembles it in form or mode of life.

The jelly fishes, with few exceptions, are short-lived in comparison with other radiates, some of the polyps living many years, while star fishes and sea urchins are sometimes ten or a dozen years in attaining their maturity. The acaleph's cycle of existence is only about twelve months. The eggs, laid in the fall, become hydroids in the winter, jelly fish in the spring, and, having made the necessary arrangements for a continuance of the species, die during the autumn. Great numbers of jelly fishes are annually killed by the severe storms of that season, and are washed upon the beach, where they almost literally melt into jelly, and leave no trace behind, there being none but the most perishable elements in their physical construction, nearly the entire animal being water. Mention is made of one specimen, which when alive weighed thirty-four pounds, being left to dry for some days, and then weighed five and one half ounces. The radiate partitions of the polyps are changed into tubes in the jelly fishes, but the general law of radiation is strictly followed. Excepting a few species they are all jelly-like in their construction; the *discophoræ*

have a trifle more solid structure, but all are exceedingly soft and frail.

Very many of the more delicate species are so transparent that the casual observer often fails to see every portion of a specimen, even in the still water of the aquarium, until a movement of the animal presents its parts in a different light.

A great variety exists in the shape of these animals, and they vary no less in size, some being so small as to be entirely overlooked by the casual observer, while Agassiz mentions one a *cyanea arctia*, a sea blubber, whose umbrella-shaped disk measured seven feet across, while the tentacles which streamed behind him measured roughly about one hundred and twelve feet. The parent of this monster is one of many from a single egg, transformed first into a stalk not unlike a cabbage stump in shape, but which subsequently changes into a tolerable representation of a pile of saucers, open side up. Each saucer, when cast off, turns over and is then a perfect cyanea. Yet the stalk which produces all these, when full grown, is but an inch or so in hight. Were it not for their delicate structure these creatures would be as dangerous as sharks, for each of these long tentacles is capable of producing a severe smarting sensation by mere contact, while their nearly perfect transparency renders their noiseless approach almost imperceptible. Bathers along the coast of the Atlantic often encounter these unawares, and lose no time in extricating themselves from the dilemma, while large, red swellings, not unlike those produced by nettles, attest the truth of the contact. It sometimes happens that the jelly fishes which are possessed of these stinging threads—for many of the species are without them—find themselves entangled with a too formidable antagonist. In such an event they drop or shed the tentacles, and escape with all possible haste; but notwithstandfng their separation from the body of the jelly fish, contact with the dead tentacles is equally painful as when living.

The stinging property is used by the jelly fish not only for defence but also for the purpose of paralyzing and retaining its prey, which consists of small crustacea, fish and other jelly fish, or polyps. Captured individuals often show the remnants of a meal, their transparency affording the most perfect study of their internal organisms. These tentacles are covered by minute cells, lasso cells as they are called, each one of which contains a whip finer than the finest thread, coiled in a spiral within it. These are thrown out at the will of the animal, and their movements are so instantaneous that their irritating power is very great.

The Portuguese man of war is also an acaleph, belonging to a prominent genus. This individual, *physalia arethusa*, is one of the most remarkable of the group. The pear-shaped sack, ornamented with a sort of shirt ruffle fringe or crest, and filled with air, gracefully floats upon the surface of a calm sea, while beneath it trail numerous appendages of various functions. These may be compared to the members of a military or communist organization. Each pendant has its own peculiar duty. Some are the providers, commissaries; others are the locomotive organs, while still others are charged with the duty of growing new medusæ buds for the perpetuation of the race. Those tentacles which belong to the transportation department often extend to a distance of thirty feet from the main body of the animal, which is usually but five or six inches in length. This hydroid is properly an inhabitant of the tropical seas, but occasionally, having drifted into the Gulf Stream, it is borne along the shores of the Atlantic far away from its native home.

The hydroids are not all free to move about at will. Agassiz and Vogt have thrown the two together, this simple difference not warranting distinctive groups in which earlier naturalists had placed them. Many of the hydroids bear a close resemblance to some species of vegetation growing on the bottom, where at low tide they are taken by the casual observer for marine plants. Some of these are exceedingly minute; and the little bell; or buds, in which the diminutive embryo creatures are imprisoned, are, to all casual observers, flower buds or seed vessels. This is also true of the polyps, which, in structure and colors, resemble nearly every form of vegetable life.

The colors of the jelly fishes are as varied as are their forms and dimensions. In the *bolina* for instance, there is a marked resemblance to a beautiful white flower. The *cyanea* is a dark, brownish red with a milk-white margin, and tentacles of purple, yellow, and pink. *Idyia* is mostly of a bright pink, while red, yellow, orange, green, and purple chase each other rapidly along its undulating fringes. Other varieties appear in no less beautiful and different shades of beauty; while at night, if the sky be overcast or the moon is not a disturbing witness, the slightest movement, of the depths where these delicate beauties are, brings out the most resplendent flashes of green and gold and liquid phosphorescent flames that seem almost to kindle the entire waters. Myriads of the lesser varieties, scarcely noticeable in the bright light of day, thus disturbed, become globes of brilliant gold, and the oars of the boat, as they rise from the water, drip with liquid flame given out by these and other minute inhabitants of the deep, while the glistening particles extend far in the diverging wake of the passing craft.—*Home and School.*

Meteorites.

In the present article we propose to consider the so-called detonating meteors, or *bolides*, which from time to time fall upon the earth as masses of stone or metal. It may indeed be a question whether these bodies really differ from the ordinary meteors in anything but size; many of the highest authorities think they do not. Still the fact that even during the most remarkable meteoric showers no sound has been heard, and not a single fragment has been known to reach the ground, seems to warrant us in classing the bodies by themselves, at least provisionally. They appear to bear much the same relation to the shooting stars which planets do towards comets.

As late as 1800 men of science in general were disposed to be very skeptical as to accounts of stones and iron falling from the sky, and those who admitted the fact had recourse to most curious and absurd hypotheses to account for it: some, for instance, thought the stones were formed in the air by lightning, while others maintained that they came from volcanoes on the earth or moon. Chaldni, however, in 1794 published a paper upon the origin of a remarkable mass of native iron found by Pallas, the Russian explorer in Siberia, maintaining it to be meteoric, as is now universally admitted; and to strengthen his position, he went into a careful criticism of various accounts of the fall of such bodies, compiling a catalogue of some

300, and affirming their credibility. His reasoning made an impression, but still failed to enforce general assent, until in 1803 an event occurred which put an end to all skepticism. On the 26th of April in that year, a meteor exploded over the village of L'Aigle in Normady, within 85 miles of Paris; and more than 2,000 fragments, of weights ranging from 20 pounds to a fraction of an ounce, were scattered over a region of several miles. The Academy of Sciences sent a special committee to investigate the matter. They collected specimens, took the sworn dispositions of those who had witnessed the phenomena, and in their report put the reality of the occurence beyond all possible doubt.

The phenomena which accompany the fall of these bodies are much the same as those of the shooting stars, except that they are ordinarily far more brilliant; and observers who are near the path of the meteor usually hear a rushing roar, like that of a heavy railroad train, accentuated by several cannon-like reports which are sometimes heard at a distance of a hundred miles. At each of these explositions, whose cause is only doubtfully explained the meteor changes its course or breaks into fragments. In a few instances, when the fall took place in the daytime, no luminous phenomena were seen, and in one or two cases the fall of very small aerolites has been unaccompanied by noise. Thus, in March, 1859, there was a shower of little stones in Harrison county, Indiana, one of which, about as large as a marble, fell within a few feet of a man and his wife who were standing in their cabin, with no other warning than the tearing of the missile through the leaves of the trees. The character of the stone, and of several others which fell at the same time, removes all doubt as to their meteoric origin.

There are several instances on record of mischief done by meteors. In 1511 a monk was killed by one at Crema; in 1650 another monk at Milan; and in 1674 two sailors on a ship in the Baltic. One of the aerolites which fell at Barbotan in 1790 broke though the roof of a house and killed a peasant and a bullock.

When these bodies have fallen among the ignorant and superstitious, they have usually been regarded with great reverence, and become objects of worship. The Palladium of ancient Troy, which by some writers is described as a shapless mass, is supposed to have been an aerolite; so also the image of Diana of Ephesus that fell down from Jupiter; and the mysterious black stone of the Kaaba at Mecca. The stone which fell at Parnallee in Southern India, in 1867, was for some time worshipped by the natives.

The number of meteoric falls is very considerable, our cabinets now containiug specimens derived from nearly 300 different localities; and if we added the specimens which are supposed to be of metoric origin, though the date of their fall is unknown, we must at least double the number. Recalling now how small a portion of all that reach the earth would ever be found, because so much of her surface is covered with water, or forest, or desert, it becomes evident that the total number of such events is to be counted by the thousand in every century. In fact, the scientific journals usually contain the notices of some five or six on the average every year.

Meteorites differ greatly in size. They seldom fall singly; but the mass which enters the atmosphere, chilled to the temperature of interplanetary space, breaks up, under the action of the sudden and intense heat generated by the resistance of the air, into fragments which, as a rule, seldom exceed 150 pounds in weight, while the majority are much smaller, say from 20 pounds to a few ounces. Since, however, the number of fragments is often very great, the total weight of a single meteoric mass sometimes amounts to tons. This seems to have been the case with the shower of stones which fell at Weston, Conn., in 1807, and the more recent fall at New Concord, Ohio, in 1860.

The different specimens from the same fall of course always closely resemble each other, being merely fragments of a single mass; but aerolites from different falls differ widely in almost every respect, with however a few marked features of resemblance. They are always coated with a thin, black, highly magnetic crust formed by superficial fusion, and they invariably contain a considerable amount of iron, ranging from 20 to 25 per cent. to more than 90. This may, according to Maskelyne, be broadly classified into three divisions: the iron meteorites or siderites; the stony meteorites, or aerolites (air stones); and an intermediate class, represented by exceedingly rare specimens, which consist of a honeycombed mass of iron filled in with stony matter, and are known as siderolites (steel stones).

SIDERITES.

Compared with the aerolites, the siderites are very rare. As yet only five cases are on record in which meteoric iron has been seen to fall; at Agram in Bohemia, in 1751; Dickson county, North Carolina, 1835; Brannau, Austria, 1847; Victoria, South Africa, 1862; and Maysville, California, 1873. A recent fall in Nevada is reported to have consisted of meteoric iron, but the report needs confirmation. While, however, the instances are so few in which the actual fall of iron masses has been observed, we have in our cabinets some 200 specimens of native iron, which from the circumstances under which they were found, and their resemblance to the Agram meteorite in chemical constitution and crystal structure, are pretty certainly concluded to be of metoric origin. Such are the great masses from Orange river in the British Museum, the Red River iron from Texas in the Cabinet of Yale College, and the Ainsa iron in the Smithsonian rooms at Washington. A marked peculiarity of all meteoric iron is its alloy with a considerable quantity of nickel, varying from 5 to 15 per cent. A second characteristic consists in a peculiar crystaline structure, which is best brought out by polishing a cut surface and acting upon it with a weak acid. Quite recently, also, Graham and others have found that a large quantity of hydrogen, and smaller amounts of carbon oxide and other gases, chiefly hydrocarbons, are occluded in the pores of meteoric iron, and can be liberated by heat.

AEROLITES.

The aerolites, or stony meteorites, which form the vast majority of all that have been seen to fall, differ very widely among themselves. Some are hard and compact, while others are as friable as rottenstone. The aerolite of Bishopsville, S. C., though covered with the invarible black crust, is internally almost as white as chalk, and as light as pumice; that of Kold Bolkkeveld, South Africa, on the other hand, resembles a piece of anthracite coal more than anything else; and that of Orgueil, a mass of rather coherent garden soil. The majority, however, are heavy grayish rock, something like sandstone, made up of crystals or minute spheres of various peculiar miner-

als (many of which are never found in terrestrial rocks), interspersed with nodules of nickeliferous iron and cemented together by compounds of the oxides of iron. If exposed to atmospheric influence for a few years only, the mass disintegrates and falls to pieces, and this probably explains why so few aerolites have ever been found except in immediate connection with their fall. The siderites, on the other hand, remain for centuries but slightly altered.

According to Maskelyne the following 24 elements have been detected in aerolites, namely, *hydrogen, lithium, sodium, potassium, magnesium, calcium, aluminum, manganese, iron, nickel, cobalt, copper*, tin, antimony, arsenic, vanadium, phosphorus, *sulphur*, oxygen, silicon, carbon and chlorine. Those italicized are also shown by the spectroscope to exist in the sun, together with zinc, strontium, and cadmium, which thus far have not been found in meteorites.

ORIGIN OF METEORITES.

The origin of these bodies is as yet a matter of speculation. They enter our atmosphere, however, with a velocity so great (often exceeding 20 miles per second) as to make it certain that they do not come from any terrestrial source, or even from the moon. And for the same reason they cannot well be, as some have thought, "the minute outriders of the great family of the asteroids," for then the velocity with which they would reach us would be only the difference between their velocity and ours. It seems impossible to avoid the conclusion that their orbits must be unplanetary, not approximately circular, but very eccentric, like those of comets and the ordinary shooting stars. It may be, as Mr. Proctor has suggested, that some of them, the siderites especially, have been ejected from our own or some other sun, by some of those tremendous outbursts of solar energy which we occasionally observe with our spectroscopes; or they may have originated, as Moigno argues, in the cracking to pieces of some old and used-up world.

At present, all we know is that they come to us from the outer darkness of interstellar space. As Humboldt has said: "They present to us the solitary instance of a material connection with something which is foreign to our planet. We are astonished at being able to touch, weigh, and chemically decompose metallic and earthy masses which belong to the outer world—to celestial space—and to find in them the elements of our native earth, making it probable, as the great Newton conjectured, that the materials which belong to our group of cosmical bodies are, for the most part, the same"—*Professor C. A. Young, in a Boston Journal of Chemistry of 1876.*

The Arizona Antiquarion Society.

This society was organized at Prescott, Arizona, December, 1895. Its object is to form a representive collection of Arizona's relics of ancient races, and incidently to form a museum of all the curiosities and scientific specimens to be found in Territory. Persons having specimens or information of value are requested to send them to the President, Dr. Miller of Prescott. Specimens may also be sent to the University of Arizona, at Tucson, label specimen "for the Collection of the Antiquarian Society."

The next meeting will be in July at Flagstaff, Arizona. All interested citizens of Arizona are asked to join.

Mineral and Vegetable Waxes.

Mineral waxes are hydrocarbons, often crystallizable, and differing from each other in their temperature of fusion. They are frequently derived from resinous trees buried in the peat beds, and rarely from lignites or coal formations. The principal variety used industrially is ozokerit, sometimes called natural paraffin. It is less dense than water, of a waxy luster, and in one direction presents a conchoidal fracture, breaking into thin transluent scales. Its color is a brownish green by reflected light or yellowish brown or red by transmitted light. Powdered, it is a yellowish white. It is soft, flexible, cuts like wax, and softens at a low temperature. The odor is aromatic, and becomes more bituminus when the wax is rubbed. Friction also electrifies it negatively. It is fusible into a clear oily liquid, and burns with a bright flame. It is soluble entirely in turpentine and naptha, more or less in ether, and slightly so in boiling alcohol, when the material separates in crystalline state on cooling. It is unattackable by sulphuric acid.

Ozokerit is found in the Caucasus, in England, and in Austria. In Moldavia, it is directly employed for illumination, being used in gas making, and in the manufacture of candles. A factory in Frankfort on the Oder prepares the material under the name of ceresine, and prodnces over 100,000 lbs. yearly. Ozokerit, in purified form, is largely used by perfumers and in pharmacy in place of beeswax, as it hinders medicaments from becoming rancid.

A similar substance, now but little employed, is hatchetin or mineral adipocere. This is of a yellowish white color, has a mother-of-pearl luster, is very soft and is of about the consistence of spermaceti. It is found in Belgium, Moravia, Bohemia, Wales, and England. It is scarcely attacked by nitric acid, but is completely carbonized by sulphuric acid. It is slightly soluble in boiling alcohol and in ether, leaving a viscous and inodorous residue.

Other mineral waxes are *neft-gil*, found in the island of Tschelekan in the Caspain Sea, near naptha sources, and balkerite, from the vicinity of Lake Baikal. These are fossil waxes, or more probably bitumens, as are also kir and elaterite. The latter, often termed elastic bitumen or mineral caoutchouc, is of less density than water, of a blackish color, and is elastic like rubber. It has been found in this country, near Woodbury, Conn., and in many parts of Great Britain.

There is a large number of vegetable waxes but slightly known. Some are secreted by insects, which absorb the sap of various plants. Others are derived from the exudations of palm trees. The *Copernicia cerifera*, a Brazilian tree, bears leaves from the glands of which carnauba wax is obtained. The commerce in this material exceeds 2,000,000 lbs. yearly. In the Andes there exists the *ceroxylon andicola*, which also yields a material known as palm wax.—*La Nature.*

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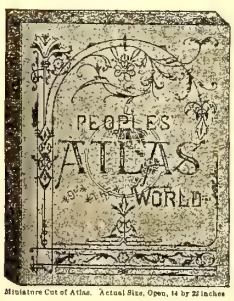

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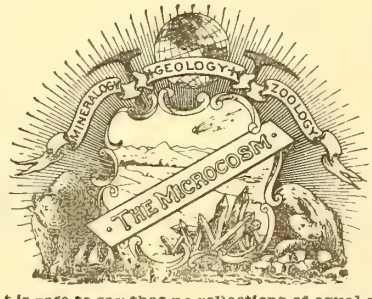

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EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C

NATURAL SCIENCE NEWS

VOL. II. No. 2. ALBION, N. Y., FEBRUARY 8, 1896. Whole No. 54.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED;—"Bird Nesting in Northwest Canada," back Nos. of OOLOGIST. Can offer "Kombi" and No. 2 Autoharp. F. A. COLBY. Hyde Park, Mass.

EXCHANGE:—I wish to exchange Minerals for Indian Relics from Eastern and Southern States or a copy of Dana's new book on Minerals and how to study them. ISAAC S. KIRK, Fremont, Pa.

COLUMBIAN STAMPS in set, used or unused, for cash or in exchange for curiosities. LINDEGARD BROS., Hallock, Minn. 54-2t

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YOU NEED DATAS:—100 Standard Data blanks with your name and address printed thereon sent postpaid for 25c; 200 for 40c; 500 for 75c. THOS. H. BLODGETT, Galesburg, Ill.

MAGAZINES:—A number of Natural History Magazines to exchange for *Nidiologists*, *Oregon Naturalists*, or Natural History Specimens and Curios. List for stamp. P. I NEISTER. Sioux Falls University, Sioux Falls, So. Dak.

WANTED:—A second-hand copy of Davie's Nests and Eggs. Must be in good condition. Good exchange in stamps or cash. HORATIO H. ARMSTRONG, Kirkwood, Mo.

FOR SALE OR EXCHANGE:—Tarpon rod with two tips; Von Hofe reel; Springfield rifle and bayonet; Allen & Wheelock rifle. Stamps taken. Want 12 or 16 ga. Hammerless for 10 ga. Ithaca Hammerless, new, or cash offer. H. I. BENEDICT, 20 Main St., Lockport, N. Y.

WILL PAY CASH for photographs of birds, or their nests or eggs. Send list with best prices. WALTER A. JOHNSON, Box 500, Galesburg, Ill.

TO EXCHANGE:—A gold-filled American style hunting case watch, gents size; case warranted for 20 yrs., works 10 yrs. Will exchange for $30.00 worth of good sets. GEO. W. DIXON, Watertown, S. D. FO-2t

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WANTED:—*Nidiologists* and *Oregon Naturalists* to complete files. Can offer in exchange a number of Natural History Magazines. List for stamp. P. I. NEISTER, Sioux Falls University, Sioux Falls, So. Dak.

FOR SALE OR EXCHANGE:—Fine sets of *Unios* for museums, polished or natural. Desire *U. tuberculatus*, colored nacre, opals, fine crystals, minerals and fossils or marine curios. MRS. E. WISWALL, Kenosha, Wis.

A BARGAIN.—I offer the following fine *new* books for fine sets at once, viz: Ireland, Its History, Scencry and People, 3 vols. in one, large octavo, $12.50; Ridpath's Popular History of the U. S., Imperial Octavo, $12.50; Smith's Dictionary of the Bible, 1017 pages, large octavo, $10.00; Gibbon's History of Rome, 6 vols., gilt top, $18.00. GEO. W. DIXON, Watertown, So. Dak.

FOR NUMBERS 21 and 31 of NATURAL SCIENCE NEWS will give 15 cents worth of foreign stamps or Nos. 22 and 40 of the NEWS. C. E. RISLEY, 19 Lake Ave., Middletown, N. Y.

FOR SALE.—A 5x8 Photo. outfit which contains 5x8 camera, Fairy Tripod, 5x8 lens and shutter, pair of stereoscopic lenses, 6 double plate-holders and carrying case; will sell for $20.00. Also a pocket kodak with carrying case for $3.00; and a 4x5 Kodak which uses plates and film for $5.00. All in perfect order. JOHN BOWMAN, Box 741, Aspen, Colo.

WANTED.—A good violin and bow in A1 order. Offered:—fruit and ornamental trees, vines, shrubs, flowers and Indian relics. C. E. PLEAS, Clinton, Ark.

EXCHANGE.—$50 case of birds and animals, (26 specimens) in fine condition, for $25 worth of poultry netting or wire fence. C.E. PLEAS, Clinton, Ark.

WANTED—From the South and West, common sets and large singles. Have in exchange Vol. I N. S. NEWS, sets, and rare Canadian singles at ¾ rates. R. W. JOHNSON, Port Hope Ont.

GOVERNMENT Reports, transactions of scientific societies etc. for other scientific books. A No. 1 eggs or postage stamps. U.S. preferred. EGBERT BAGG. 191 Genesee St., Utica N. Y. O.

BIRD SKINNING Taught free, by mail, to those who want birds mounted in exchange for skins from their locality. Start a collection. Costs no more to have rare birds mounted than common ones, if you furnish skin. Easy to learn to make scientific skins by my method of teaching with wax models and real skins before you, showing every stage of operation, with directions. Complete personal instruction, skins examined and how to perfect. Practice will do the rest. Don't delay, begin at once, and next time you have an outing be prepared to take care of any desirable specimen you come across. Write at once, naming the birds you can secure. Prices for mounting and that allowed for skins and other particulars for stamp. Want an old rifle barrel or printing press in fair condition. DELBERT MEIXSELL, Taxidermist, Pekin, Ill.

BOOKS! BOOKS! BOOKS!—Binding for Naturalists at reduced rates. Art works with special designed covers, Commercial Ruling and artistic printing on short notice. Try us. ADOLPH LAUX, Book-binder, Lockport, N. Y. 53-4t

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WANTED:—Collections of eggs in sets or singles, Persons having such for sale cheap send list and lowest price. Southern eggs in sets to exchange in the summer. DR. M. T CLECKLY, 457 Greene St., Augusta, Ga. Fo 2t. 53-2t

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PUBLICATIONS wanted: During February I will allow the following prices for numbers named of the following publications in exchange. *The Auk* Vol. I ('84) and II ('85) any number and Vol. IV ('87), No. 2 (April), 75 cts each; *Nidiologist*, Feb. '94 and April '94 at 10 cts each; OOLOGIST for Jan. '95 at 5cts each.
FRANK H. LATTIN, Albion, N. Y.

FOR SALE or EXCHANGE.—Tarpon rod with two tips, Von Hofe reel, Springfield rifle and bayonet. Best offer. Want 12 or 16 ga Hammerless for 10 ga. Ithaca Hammerless. H. I. BENEDICT, 18 Main St., Lockport, N. Y. 53-2t

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FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite. Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf

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WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, Dennis, Mass. 51-25t

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"AUKS" Wanted.—I will allow 30c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms Nos. 1 and 2 of NATURAL SCIENCE NEWS at 10c each and the following No's of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete*, *clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

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WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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5. " filamentosa, 1 to 3 inch..... 2
6. Cardium magnum, 3½ to 4 inches..... 6
7. " muricatum, 1½ inch single valves 1
8. " serratium, 1 to 2½ inch..... 3
9. Arca ponderosa, 2 to 3 inch..... 3
10. " noæ. 1 to 4 inch..... 3
11. " floridanum, 2 to 2½ inch..... 3
12. Cytherea (callista) gigantea, 3 to 5 inch...10
13. " " maculata, 1 to 2½ inch 6
14. Natica duplicata, 1 to 3 inch..... 2
15. Chama Arcinella, 1 to 2 inch..... 5
16. Dosinia discus, 2 to 4 inch..... 5
17. Pholas costatus, 3 to 6 inch, double valve...15
18. Murex pomum, 1 to 3 inch. 3
19. " salleanus, 1 to 3 inch 5
20. Pyrula papyratia, 3 to 5 inch..... 8
21. Pecten exasperatus, ½ to 3 inch, single.... 1
22. Conus Floridanus, ¾ to 1 inch..... 2
23. " proteus, 1 to 3 inch..... 10
24. Pinna muricata, 4 to 10 inch 8
25. Lucina edentula, 1½ to 3 inch, single 2
26. Cancellaria carolinensis, 1 to 1½ inch..... 3
27. Oliva litterata, 1 to 2½ 2
28. Anomia ephippium, 1 to 2½ inch..... 1
29. Melongena subcoronata, 2 to 6 inch..... 8
30. Cerithium eburnum, 1 to 1½ inch 3
31. Turritella, 1 to 1½ inch..... 2
32. Tellina, ½ inch..... 1
33. Marginella, ¼ inch..... 2
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35. Sea beaver..... 15
36. Conch spawn ribbon 18 inch to 2 feet..... 20
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38. Rose coral, shaped like a rose 10
39. Florida air plants..... 10
40. Tarpon scales..... 2

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Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

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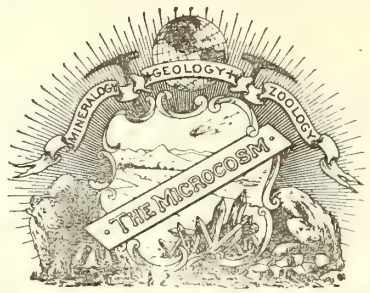

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EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C

An Easter Edition

OF 25000 COPIES OF THE

Natural Science News

Will be printed during the latter part of March and mailed not later than April 10th.

A copy will be mailed to every know Naturalist and Curio Collector in in America and to over 1000 selected live ones in Foreign countries.

ADVERTISING RATES will be advanced for this Easter edition as follows:

WANT, EXCHANGES and FOR SALE Notices will cost **50cts per 35 words**, 1c per each additional word, each figure counting as a word.

Coupons given with subscriptions will be honored in payment for notices in these columns in the Easter edition at 25cts each.

ADVERTISEMENTS will be taken at,

10 cents per nonpareil line. 12 lines per inch.
120 lines per column. 360 lines per page.

The minimum price for a single advertisement in the Easter edition will be 50c. A 5 line advertiesment or under will cost that amount.

Not to exceed one full page of space will be accepted from any single person or firm.

NO DISCOUNTS will be allowed at this, less than nominal, rate. Hence a

5 line or less advertisement will cost $ 50
12 line (1 inch) advertisement will cost $1 20.
60 line (½ col.) advertisement will cost 6 00.
120 line (1 col.) advertisement will cost 12 00.
180 line (½ page) advertisement will cost 18 00.
360 line (1 page) advertisement will cost 36 00.

Cash Must Accompany Order

Unless you have a satisfactory rating with either Dun's or Bradstreet's Commercial Agency, or can give me satisfactory Bank Reference, or have already had sufficient dealings with me to satisfy me of your financial reliability, the cash must accompany your order. If, however, you have either of the above three requirements and your order is for space amounting to over $2.00 I will neither require nor ask for a single cent's pay until I prove to you

1st—By my printer's affidavit that I have issued 25,000 copies of the Easter edition of NATURAL SCIENCE NEWS.

2d—By my P. O. postage receipts that I have mailed at least 20,000 of the number.

Rates to regular advertisers WILL NOT BE ADVANCED. I will not, however, allow them to use more than the *average* number of lines which they agree to use in each issue for the entire year at this heavy loss to myself. Should they wish to increase the size of their regular advertisement, however, they can do so at the regular rate, for this issue, of 10cts per line.

First and Last Pages

Are always considered more desirable by many, although the Publisher knows that *every* page in this issue will be "religiously" read. However, if YOU consider the first or last page preferable and are willing to back your preference with the "price," I will sell the space on these pages as follows:

On the first page: Small "Want, Exchange and For Sale" advs. on FIRST PAGE will cost $1.00 per notice of 35 words or under. Exceeding 35 words, 3 cts per each additional word.

The Last Page will be sold to a single party or firm and will not be divided. My price for the same will be $50 net.

This Easter issue is sure to prove a "howling success" and it is my desire to have YOU "in t" and share in the fruits thereof.

Expecting to hear from **you** at an early date, providing you wish to share in the success of the issue, I remain, as ever

Faithfully,

FRANK H. LATTIN, Publisher, ALBION, N. Y.

Natural Science News.

VOL. II. No. 2. ALBION, N. Y., FEBRUARY 8, 1896. Weekly, $1.00 a Year

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Subscriptions can begin with any number. Remittances should be made by Draft, Express or Post Office Money Order, or Registered Letter. Unused U. S. Postage stamps of any denomination will be accepted for fractional parts of a dollar. Make Money Orders and Drafts payable, and address all subscriptions and communications to FRANK H. LATTIN, Albion, Orleans Co., N. Y,

Entered at Albion P. O. as 2nd class mail matter

Mammoth Cave.

Mammoth Cave is situated eighty-five miles South of Louisville, and eight miles from Cave City, a station on the line of the Louisville and Nashville Railroad. Passengers desiring to visit the Cave are carried to and from the trains in McCoy's Concord Coaches. All through passengers are allowed to stop off at Cave City within the limits of their tickets for the purpose of visiting the Cave. The Short Route in the Cave may be made with but one day's detention, while two days will be necessary to make the Long and Short Routes, and weeks may be pleasantly spent (under the new management) at the Cave Hotel, with its romantic surroundings. So much has been written of this world-famous wonder that it is impossible to say anything new in regard to it. It cannot be described. Its caverns must be explored, its darkness "felt," its beauties seen, to be fully realized. The pencils of the artists have been used in picturing its pits and domes, but they have failed as completely as the brush of the painter fails to fix upon the canvas, the ocean in a storm or the sunrise from a mountain peak.

Bayard Taylor says of the Cave after visiting all the great natural wonders of the Old and New World:

"I had been twenty hours under ground, but I had gained an age in a strange and hitherto unknown world; an age of wonderful experience, and an exhaustless store of sublime and lovely memories. Before taking a final leave of the Mammoth Cave, however; let me assure those who have followed me through it that no description can do justice to its sublimity, or present a fair picture of its manifold wonders. It is the greatest natural curiosity I have ever visited, Niagara not excepted, and he whose expectations are not satisfied by its marvelous avenues, domes, and starry grottoes, must either be a fool or a demigod."

Another prominent writer says of the ride on Echo River:

"This alone is worth the trip across the ocean. Darkness indescribable, stillness which can only be likened to the tomb, yet gliding over waters without a wave, a stream without beginning or end. 'Rocked in the Cradle of the Deep,' sung in a deep, manly voice, wakes the 'echoes,' and the reverberations go down the cavernous depths for miles and continue sounding in fainter and fainter tones until they seem to finally die away at an immense distance. William (the guide) then sings the 'Sweet By and By,' and more melody is heard than was voiced by the 'Swedish Nightingale' in the days when whole cities hung upon her tones. If Nilsson, Kellogg, or Gerster should go there and sing, the music would surely call back to life the 'dwellers in the caves,' and bring out the rock-riveted melodies of the lost ages. Could one only live on in such a charmed life, no other paradise need be sought."

Mammoth Cave Hotel is open all the year, and a visit to the Cave at any season of the year is delightful, the temperature, fifty-five degrees, being the same summer and winter. The salubrity of the Cave, so far as its effects on the health and spirits of visitors are concerned, is decidedly marked. On account of the excess of oxygen the air is very exhilarating, and sustains one in a ramble of five or ten hours, so that at its end he is hardly sensible of fatigue. The most delicate can visit it without fear of heat, cold or exhaustion.

We can not do better than to give an extract from the account of a visit paid the Cave by H. C. Hovey, and described by him in Scribner's Monthly.

We left the cars at Cave City, a station on the Louisville & Nashville Railroad, eighty-five miles south of Louisville, and mounted to the top of a stage coach, that makes two daily trips to Mammoth Cave, nine miles distant. Edmundson County, within whose limits it is located, has about four thousand sink-holes and five hundred open caverns, many of which are but nameless grottoes, while others have gained celebrity. The road winds among the hills and across a high table-land to the bluffs of the Green River. Openings are observed here and there amid the rocks, each being as the driver assured us, the mouth of a cave.

A bugle-flourish heralded our arrival at the Cave Hotel (recently leased to W. C. Comstock, who has had a large practical experience in hotels, and is now managing this in such an efficient and pleasant manner as to please the public, and make their stay there a delightful one)—a spacious building evolved from a log-cabin germ—and brought around the coach a throng of guests expecting friends, and negro-servants offering to take our baggage.

Adjoining the office is a cabinet where specimens are for sale, the rules judiciously forbidding visitors to help themselves. Another rule prohibits the use of surveyors' instruments, lest some unscrupulous person should find a new entrance beyond the five thousand acres now comprising the estate and steal the Cave. Visitors can not dispense with the guide and are cautioned to keep him in sight. Persons accidentally separated from their party should quietly stay in one place until their presence is missed and search made for them.

The regular hours for entering the Cave are ten o'clock a. m. and seven p. m. The Short Route generally being taken in the evening and the Long Route in the day. An outfit includes a close-fitting cap, a stout dress, a walking stick, a swinging lamp and some matches. The guide for each party carries extra lamps, a can of lard oil, a lunch-basket, and a haversack of fire-works. The guides are familiarly known as Old Mat, Old Nick, William, John Lee, and J. M. Hunt. The original guide, whose daring exploits and striking traits made him famous, was

Stephen Bishop; his remains now rest in the tangled grave-yard near the garden.

Mammoth Cave has a noble vestibule! Amid tulip-trees and grape-vines, maples and butternuts, fringing ferns and green mosses, is the entrance to this under-ground palace. From a frowning ledge a cascade leaps to the rocks below, where it vanishes at once, forming no running stream. The entrance to the cave is one hundred and ninety-four feet above water-level, and one hundred and eighteen feet below the summit of the bluff on which stands the hotel. A winding flight of seventy stone steps conducts us around the cascade into an ante-chamber. At the end of this is a grated iron door to which each guide has a key. As we cross the portal, a strong current of air blows out our lights; but a few yards within, where the draft is weaker, we rekindle them. This phenomenon is due to a marked difference in temperature between the atmosphere within and that without the Cave. Both the air and the water in the cave nearly correspond with the heat of the earth itself, which in that latitude varies but little from fifty-six degrees Fahrenheit throughout the year. In some of of the dryer chambers the mercury rises to fifty-eight degrees, and in some of the springs and pools it falls to fifty-two degrees. The thermometer at the hotel-office indicated eighty degrees in the shade, a difference on that day of nearly thirty degrees, which caused, of course, a strong outward flow.

The simple truth about Mammoth Cave surpasses the most ingenously woven fabrication. Its areal diameter is nine or ten miles. Its known and numbered avenues are two hundred and twenty-three, and their united length equals one hundred and fifty to two hundred miles. Twelve million cubic yards of space have been excavated from the rocks by the agency of air and water. Such are the windings, crossings, and evolutions of this labyrinth, that we found, by the time our explorations were ended, on adding up all our daily trips in and out, we had traveled about one hundred miles under ground.

The main Cave, so called in distinction from minor avenues opening into it, extends like a deserted river-bed, through a succession of noble arches and domes, to a point six miles within, where it is abruptly closed by fallen rocks.

Singular effects are produced by the incrustations of gypsum stained by the black oxide of iron, seeming to cut gigantic silhouettes from the ceiling of white limestone. At first we ridiculed these fancies, but at last they fascinated us. Bears, monkeys, anteaters, catamounts, indeed, a whole menagerie is on exhibition, including the old mammoth himself. We were especially interested in a side-show of a giant and giantess playfully tossing papooses to and fro. The Giant's Coffin is near by—a rock shaped like a mighty sarcophagus. It is detached from the ceiling, walls, and floor, resting its weight on stone trestles, and equals in size one of the famous blocks of Baalbek, being forty feet long, twenty wide, and eight deep.

A strangely beautiful transformation scene is exhibited in the Star Chamber, a hall seventy feet wide, sixty high, and five hundred long. The lofty ceiling is coated with black gypsum, studded with thousands of white spots, caused by the efflorescence of sulphate of magnesia. Our guide asks us to sit down on a log bench by the wall, and then, collecting the lamps, vanishes behind a jutting rock, whence, by adroit manipulations, he throws shadows flitting like clouds athwart the starry vault. The effect is extremely fine, and the illusion is complete. One can easily persuade himself that the roof is removed, and that he looks up from a deep valley into the real heavens.

"Good-night" says the guide; "I will see you again in the morning."

With this leave-taking he plunges into a gorge, and we are in utter darkness. Even the blackest midnight in the upper world has from some quarter a few scattered rays; but here the gloom is without a gleam. In the absolute silence that ensues, we hear the beating of our hearts. The painful suspense is at length broken by one of those strange outbursts of laughter that come when least expected; and, then we indignantly ask each other the meaning of this sudden desertion. But while we are roundly berating the guide's treachery, we see in the remote distance a faint glimmer, like the first streak of dawn. The light increases in volume till it tinges the tips of the rocks, like tops of hills far away. The horizon is bathed in rosy hues, and we are prepared to see the sun rise, when all at once the guide appears, swinging his cluster of lamps, and asking us how we like the performance. Loudly encored, he repeats the transformations again and again—starlight, moonlight, thunder clouds, midnight, and day-dawn, heralded by cock-crowing, the barking of dogs, lowing of cattle, and various other farm-yard sounds; until, weary of an entertainment that long ago lost its novelty for him, he bids us resume our line of march. It is doubtful if one visitor in fifty goes farther into the main cave than the Star Chamber; but none fail to see this favorite hall of illusions. We revisited it frequently during our stay. The path to it is dry and well trodden. A pleasing incident comes to mind, showing how easily it may be reached, although more than a mile under-ground. One evening after tea I had entered thus far alone, without a guide, and after studying for a while the peculiar effects of light and shade, I sat down on the log bench and put my lamps out, in order to enjoy the luxury of utter darkness, silence and solitude. But ere long voices were heard and mysterious peals of laughter. Soon the day-dawn effect was unexpectedly produced, by the approach of a party of jocund youths and maidens, with lights, who, having dressed for a hop, first paid a visit to this enchanted ground, and as cave-dust never flies nor sticks, they did so without a speck on polished boots or trailing robes.

The avenues, as all side-passages are termed, vary in importance, some of them rivaling the main Cave, while others involve grievous climbing and crawling, with small recompense.

(TO BE CONTINUED.)

The Coral Islands.

In asking his hearers to accompany him on a sailing expedition, notwithstanding the stormy weather outside, the lecturer assured them that they would be most likely to encounter a calm sea and fair weather on the magnificent waters of the Pacific ocean, with its thousands of islands far away from any coast. Those who are familiar with the glowing narrations of Captain Cook and other navigators will remember that the presence of an island is recognized, long before it becomes visible, by clouds directly above it in the otherwise clear sky. The land absorbs the heat of the sun and accumulates it faster than the water; soon an ascending

current of warm air is formed, carrying up moisture into the colder regions of the atmosphere, where it is condensed and forms clouds. A similer phenomenon is observed in our western plains, where the sky is frequently clear early in the morning, but by 10 or 11 o'clock enough heat has been accumulated to cause the formation of clouds.

The islands of the Pacific are of two kinds, called the lower and the higher. The lower rise but 7, 10, and rarely as high as 100, feet above the level of the sea; while the higher islands reach an elevation of 10,000, 12,000, and even 15,000 feet. There is no transition between them. The most remarkable are the lower islands. Their appearance is very peculiar. In the first place, the eye is arrested by a white beach; then comes a line of verdure, due to tropical trees; then a lagoon of quiet water of a whitish or a yellowish color; then another line of verdure, and finally, beyond all, the dark blue waves of the ocean. A picture of Whitsuntide Island illustrated the structure. It is a ring rising 7 or 8 feet above the sea level, enclosing a lagoon, and presenting the characteristics just described. The lagoon inside is but a few fathoms deep; but on the outside of the island, the water is 15,000 feet deep. Here then we have a tower-like structure reaching up from the bottom of the sea, and having a depression in its summit. Some of these lower islands are 50 miles across, but most of them are not so large. In some the ring is broken at several points and these are designated by the Malay word *atoll.*

The island of Tahiti, the principal one of the Society Islands, is a good example of the second class or higher islands. It rises 7,000 to 8,000 feet above the level of the sea, has no lagoon in its center, but a crater, and the water around it is very deep. It may in fact be considered as a mountain rising to a height of some 18,000 feet from the bottom of the sea. Outside of it is a double girdle of low islands, one near, which Darwin calls a fringing reef, and one further out, to which he gives the name of a barrier reef.

On examining these reefs and the lower islands their structure will be found made up entirely of animal remains, generation after generation having left their homes, consisting of limestone to accumulate there. On the top we find these animals living and growing, in all colors, shapes, and sizes. The higher islands, on the contrary, except those near the continent, like Borneo, Sumatra, etc., are entirely volcanic, and do not contain sandstone, granite, or gneiss, like the mountains of the continent.

The limestone of the lower islands is not due to sedimentary deposits from the ocean, but is the work of the coral animal, the great architect of the sea. According to Agassiz's description, which is here followed, these animals are but a sac, like the finger of a glove, only more leathery. Around the mouth is a series of tentacles, formed by a prolongation of the skin. They are all skin, in fact, and have no special organs, yet they digest food with tremendous rapidity, absorbing it directly. It makes no difference if you turn them inside out; they will digest just as well as before. You cannot kill them by dividing them; for they live all over, like a plant. For this reason they have been called zoophytes. If you cut one into eight parts, each part will live and set up in business for itself. Like all other animals, however, they grow out of eggs. The eggs are formed within the skin, which is double, and divided into cells by partitions or septa. When mature, they detach themselves, move about in the water, until they find a favorable place, and then establish a new colony. They do not contribute to the growth of their parent colony, which is effected in another way.

On examining a piece of coral, it is seen to be full of little holes, popularly supposed to be the places for the stomachs of the animals, but this is not so at all; the coral animal does not form a secretion around it like the mollusks, but inside, between the two folds of its skin. Coral is, therefore, the bones and not the skull of the animal. As before stated, these animafs work in societies or colonies, and their tendency is to repeat the forms peculiar to each species; thus we have corals shaped like a hand, like the branches of trees, like mushrooms, like a brain with its convolutions. They grow and multiply in these societies by budding and gemmation. The side of the animal begins to bulge out, and the protuberance so formed develops into a new mouth, which soon eats and digests for itself, but does not separate from its parent. This process goes on symmetrically, and produces the variety of regular shapes thus described.

Some distance below the surface, we no longer find these beautiful shapes, but a dense coral rock. Take for instance the coral reefs of Florida. Beginning 120 feet below the surface, we first find about 30 feet of massive rock, then the astræa, then the meandrina, and about ten feet below the surface the palmata or hand-shaped coral. In the mud between the reefs and the continent there are multitudes of branching corals of the most beautiful forms, colors and delicacy of structure. The production of coral rock is explained partly by the mechanical action of the waves, and partly by the destruction of the coral insect by the sea urchin and other animals feed on it. The waves disintegrate the structure formed by the animal, and then roll back the coral sand thus produced upon it, where it undergoes a process of induration in the course of time.

It is an interestlng question how the structure ever rises above the water level, seeing that the animal which makes it cannot live out of the water. The little architects retain enough sea water to last them over until the next tide and are so enabled to work up to the highest watermark. Actinia have been observed all closed up on the rock at low water, and then suddenly opened like magnificent flowers, 5 and 6 inches in diameter, when the tide rose.

The ring form of the Pacific islands is due to the shape of the foundation upon which the coral animals built. On the Florida coast the reefs run parallel to the land for the same reason. Now take this, together with the fact that all the high islands are volcanoes, with the regular conical shape, and you will be prepared to understand the explanation, given simultaneously by Darwin and Dana, that the low islands were originally reefs around the high islands or volcanoes, and that the latter, by the gradual subsidence of the ocean bed, sank and left the reefs appear as low islands, with a lagoon where the crater of the volcano was. The reefs, of course, were gradually carried down along with the mountain upon the sides of which they rested, but the coral insects kept on building towards the surface; the mountain appeared as a smaller and smaller cone in the center; what was left a fringing reef now became a barrier reef, and the mountain finally dis-

appeared altogether. This theory is supported by the fact that barrier reefs are found extending 1,700 feet down, while the coral insect cannot live at a depth greater than 120 feet. These facts were illustrated by fine pictures of the island of Bolabola and others, in different stages of the process of subsidence.

The vegetation on the islands is due partly to seeds floating in the sea, and partly to seeds dropped by birds. Hence there are very few species of trees and plants; but being in the tropics they flourish luxuriantly.

At present, the coral formations are confined to the tropics, because the coral animal cannot exist where the temperature falls below 60 degrees. Dana states that the central axis of the Pacific Ocean is subsiding altogether; it is already gone down more than any part of the ocean. There are now no islands at all above the water along its line.

In old geological times, the temperature of the earth must have been much more uniform for we find coral formations very abundantly in nearly all parts of the world. Other limestone formations are formed by a yet lower form of animal, a protozoon, which works at the bottom of the sea and thus covers nearly three quarters of the whole surface of the globe. A diagram was exhibited, showing what the microscope revealed to Ehrenberg in a piece of chalk.

Surely then, concluded the lecturer, if so great a portion of the earth's crust is the product of animal life, we must correct our notions of matter and force, and admire the beauty and simplicity of the economy of God, who makes the most insignificant of creatures subservient to his great works.—*From lecture delivered by Professor Guyot in 1876.*

Ice Caves of Japan.

A correspondent to the London Field gives the following account of a wonderful cave in Japan:

Some eight or nine miles from Shoji in the woods, is the entrance to the great ice cave we had come so far to see, a natural circular depression or basin in the ground in the middle of the forest,, some thirty yards across and about forty feet deep. At the foot of one of the sides is a dark opening in the lava, a few feet down which may be seen the top of a wooden ladder. This is about twenty feet long, and at the foot of it are a heap of blocks of lava, down which we scrambled for some thirty or forty feet more, till a floor of solid ice, more or less flat, was reached. Very careful progress along this had to be made to avoid slipping down and extinguishing the torches. For the first fifty yards frequent blocks of lava rise through the ice of the floor, while further on there is nothing but ice. The lava roof is sometimes thirty or forty feet above one's head, sometimes only four or five feet from the floor. The light of the torches glanced continually on icicles many feet long pendant from the roof. Presently we have passed some large blocks of ice, which had been cut by the country people for sale at Kofu some miles off. At nearly four hundred yards from the entrance about twenty wonderful ice stalagmites, from two to five feet in height, rose from the floor close to a lava wall forming apparently the end of the cave, to meet icicles hanging from the roof from which water at this time of the year continually drops on to them. The tops of these stalagmites form hollow bell-shaped cylinders, giving out a faint note like a gong when struck; they are partly filled with the water which drips on to them from the icicles above. Soon by the side of them, on the left, a low arch in the lava on the level of the floor, about three feet high, may be seen. Down this is a strong current of air; there is a rapid descent for some thirty-five feet, and thence the course of the cave has been followed for another two hundred yards or so, but owing to the strong current of air which constantly extinguishes the torches, and the smallness of the passage, which slopes down rapidly from the entrance, no detailed description of it can be given; but undoubtedly the cave runs on for some distance, perhaps to another outlet, for the current of air is very strong at the extreme point to which any one has yet penetrated.

The ice has probably remained frozen in the cave from the winter months, the action of the higher summer temperature being insufficient to do more than affect the surface of the ice floor, form a few pools of water, and melt part of the ice stalactites and stalagmites. The temperature of the cave in summer seldom exceeds 35 degrees Fah., and that in the declivity or basin in the ground at the entrance some 10 or 12 degrees higher; on going up from the latter to the level of the ground in the wood, a rise of some 20 degrees on a warm day is at once experienced.

New Subscribers.

New subscribers to NATURAL SCIENCE NEWS are always in demand and during the months of February and March its publisher will give 50 cents worth of premiums for each new subscriber a present subscriber may send him. This 50 cents worth of premiums must be selected from the list of premiums given in this issue, and ten cents must be added to cover the mailing expenses of the dresent. Remember the new subscriber can accept the $1 premium offer made on another page, and will secure all the perquisites connected with the same and this 50 cents worth of presents is an additional offer on our part made to present subscribers who will assist in enlarging the subscription list of our little weekly.

Albert H. Verrill, son of Prof. Addison E. Verrill, curator of the zoological collection of Yale University, has confessed to the theft of articles valued at $10,000 from the Peabody Museum at Yale. The thefts have extended over a period of two years, and the exact amount of the loss will probably never be known, as the young man has forgotten the number of pieces he has taken. Verrill is about 25 years old and a graduate of the class of '93.

Verrill has been an extensive patron of the advertising columns of both the OÖLOGIST and NATURAL SCIENCE NEWS during the past year and although we knew that he was selling specimens at ridiculously low prices, we considered that he had ample opportunity for obtaining the same legitimately owing to his position and more so to the station of his illustrious father. Verrill obtained an unsavory reputation as an oölogist in '93 and we were one of the first to detect him in his crooked work —later, however, he successfully hoodwinked ye editor with a plausible explanation in which he, Verrill, posed as the injured party and although we refused him space for some months we finally, under protest, and with certain very stringent conditions and stipulations, allowed him the use of the same. As yet we have no reason to think otherwise than that our readers have been treated fairly by him and received big value for the money they saw fit to invest, the question now most naturally arises as to what proportion of these goods were filched from the Peabody Museum and what proportion of those that were will ever be returned.

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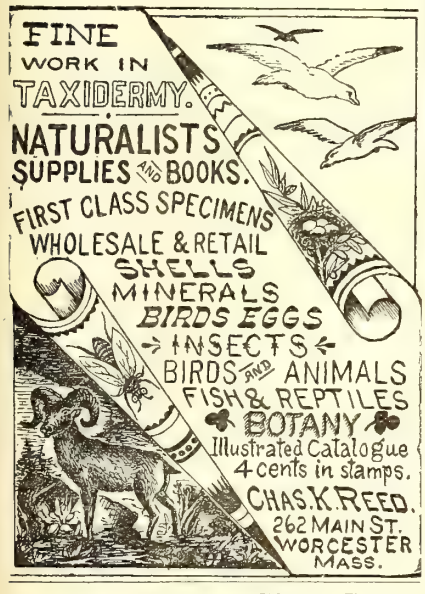

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Egg of Hammerhead or Leopard Shark 15
" Skate or Sand Shark 5
" Case of Periwinkle 15
Acorn Barnacle 10
" " double 20
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Hermit Crab in Shell 35
Sawfish Saw, 8 in 35
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Young Naturalist's Marvelous Collection, '95 edition, contains nearly 50 specimens 75

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Packet, 100 var ..... $ 15
" 100 choice mixed, retail 1-5c 35
" 1000 mixed 50
Sheet of 25 selected 1c stamps 15
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" " 25 " 3 " 45
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Set of 6 var., unused, 1 to 50c, Venezuela, 1880 ..... 15, 15
Set, 4 var., used, Chili Telegraph 25
Set, 7 var., unused, Ecuador 15
Set, 4 var., used, Ecuador, 92 10
Set, 20 var., unused, French Colonies 40
Set, 6 var., used, Guatemala, 1886 35
1c unused Guatemala prov., 1886, surch 10
4r unused, Guatemala, 1878 10
¼r unused, Guatemala, 1879 10
10c Vermillion, unused, New Brunswick, 1860 25
5c on 3c unused, British Honduras, prov., 1891 10
1c used, British Guiana, 1880 5
Portraits of Rulers 50
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Net, folding with joint handle $1 75
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Disinfecting Cones, per doz 20
Magnifier, 3 legged 75
" nickel pocket folding 35

GEOLOGISTS.

Labels, per 100 25
Magnifiers and Tweezers, see above.
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Bendire's "Life Histories of N. A. Birds" 7 50
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Stearn's "Notes on the Natural History of Labrador" 1 00
Eberhart's "Elements of Entomology," 40 plates—300 figures 50
Eberhart's "Outlines of Economic Entomology" 50
Eberhart's "Key to the Families of Insects" 25
The Pistol—A practical handbook on its Use and Care 50
Amateur Trapper and Trap-maker's Guide 75
The YOUNG OOLOGIST, Vol. I and II nicely bound 85
THE OOLOGIST, Vol. III and IV nicely bound 75
THE OOLOGIST, Vol. IX, 1892, 298 pages bound 1 00
An Exchange Notice (or a card good for one) in NATURAL SCIENCE NEWS 25
A year's subscription, with two exchange coupons, to NATURAL SCIENCE NEWS 1 00
Advertising space in NATURAL SCIENCE NEWS to the amount of $1.00. Should you desire to select this premium and not care to use the space at once a credit card will be issued for the amount which you can use when needed 1 00
PENIKESE, the issues of NATURAL SCIENCE NEWS, containing this valuable serial complete, on Agassiz's famous summer school at Penikese Island, written by an eminent Pro essor who spent both seasons at the Island 75
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Pearl Letter Openers 50
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Pocket Magnifier 35
Shell Napkin Ring 35
" Purse 25
" " fine 75
" Ship, thimble holder with aluminum thimble 50
Shell Match Safe 50
" Brooch 25

NATURAL SCIENCE NEWS

VOL. II. No. 3. ALBION, N. Y., FEBRUARY 15, 1896. Whole No. 55.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WANTED:—Davies' Taxidermy, 2d hand, for which I will offer shells, minerals, foreign stamps, single eggs and butterflies; also eggs for sale cheap. W. H. CONNERY, 202½ New Houston St., Savannah, Ga.

MANDOLIN (Rica) to exchange for a good camera. HOWARD L. WOOD, 207 Madison Ave., Albany, N. Y. 55-2t

FOR EXCHANGE:—One Gordon Setter dog, one adding machine worth $5.00, one three-joint fishing rod lancewood cost $8.00, one live Wood Duck male, one live Horned Owl female. Want skins of game birds, Passenger Pigeons or books on natural history or best offer.. A. I. JOHNSON, 406 E. 5th St., DesMoines, Ia.

FOR SALE:—Sea Shells by the doz. by the 100 or by the bbl and more reasonable than any one else can sell them; also curios and birds eggs of different kinds. Correspondence solicited. MISS IDA B. KIMBALL, New Cadiz, Fla,

VOLUME I NATURAL SCIENCE NEWS Cook's "Birds of Michigan" (new) and sets and singles to exchange for singles and supplies. Would like pair of climbers. EDWIN NUTTING, Howell, Michigan

LEAST BITTERN'S EGGS very cheap for sale or exchange this coming season. Also fine U. S. Revenues and Postage to exchange for same. EDWIN NUTTING, Howell, Mich.

FOR SALE OR EXCHANGE:—Back numbers Century, Harper's, American Agriculturist, Latin, German, French, Greek Text Books, Arithmetics, Histories, Rhetoric, 'Sun' Typewriter. Wanted Indian relics, camera, shot gun or telescope. $8 Steven rifle (list $9.50) used one season, for best offer above $5. New $2 copy "Life of Blaine," 33 illustrations, Russia binding, price $1. JOS. N. PATTERSON, Sewickley, Penna.

FOR EXCHANGE:—A taxidermist's collecting gun with shells and instruments for Coues' Key, camera, western sets or skins or small rifle. A. WELLS KIRKPATRICK, 212 Ashmont St., Dorchester, Mass. O.

FOR SALE:—Sooty Albatross 1-1 at $2.00, Whooping Swan 1-2 at $2.00, American Flamingo 1-1 at $1.50, Purple Galinule 1-7 at $1.25, American Woodcock 1-2 at $1.25, American Osprey 1-2 at $.50. All are first class and with data, cash with order. W. J. WIRT, Box 137, Gaines, Orleans Co., N. Y.

TO EXCHANGE:—50 single eggs from New Jersey for U. S. stamps. Collections of stamps for sale. HENRY HIBLER, 6331 Sheridan Ave., Chicago, Ill. 55-2t

ANIMATE CREATION, 60 parts 4to. 32 pages each, 30 oleographs, 60 full page engravings, many hundreds of other illustrations, 20 parts (Mammals) bound, cost $18.00, never used, will take $8.00. Extra large wild cat skeleton (rough) $2.00. J. J. WIRZ, Taxidermist, Augusta, Ga. 55-2t O.

WANTED *Auks*:—Complete file *Archæologist* (except No. 1 of Vol. II), 17 OOLOGISTS, 5 *Ornithologist and Oologists* for 1891 for best offer. Address V. H. CHASE, Wady Petra, Illinois. 55-2t O

OLD Peruvian, Mexican, French and Spanish dollar size silver pieces, also other foreign coins to exchange for United States stamps of value. H. E. BUKER, Rockford, Ill. 55-2t

WANTED. Meteorites, pieces and whole "finds" or "falls." Good cash prices paid also for minerals, shells, indian relics, coins and skins. I desire correspondence with reliable collectors of above. Send catalogue or list. RUSSELL NEVILLE, Kewanee, Ill

WANTED.—Good pair climbers. Can offer back numbers of Century, Vols. 3, 4 and 12 of *Oologist*, Apgar's Key, eggs, or some cash. WARREN SMITH, Fairmount, Cuy. Co., Ohio.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, Dennis, Mass. 51-25t

"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete, clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

COLUMBIAN STAMPS in set, used or unused, for cash or in exchange for curiosities. LINDEGARD BROS., Hallock, Minn. 54-2t

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612, 17th St. N.W., Washington, D.C.

PUBLICATIONS wanted: During February I will allow the following prices for numbers named of the following publications in exchange. *The Auk* Vol. I ('84) and II ('85) any number and Vol IV ('87), No. 2 (April), 75 cts each; *Nidiologist*, Feb. '94 and April '94 at 10 cts each; OOLOGIST for Jan '95 at 5cts each.
FRANK H. LATTIN, Albion, N. Y.

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New subscribers to NATURAL SCIENCE NEWS are always in demand and during the months of February and March its publisher will give 50 cents worth of premiums for each new subscriber a present subscriber may send him. This 50 cents worth of premiums must be selected from the list of premiums given in last issue, and ten cents must be added to cover the mailing expenses of the dresent. Remember the new subscriber can accept the $1 premium offer made on another page, and will secure all the perquisites connected with the same and this 50 cents worth of presents is an additional offer on our part made to present subscribers who will assist in enlarging the subscription list of our little weekly.

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ALBION, N. Y.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....		8:00	10:30	2:20	5:35	10:00	
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport.....		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50	8:15		1:00	3:05	6:45	7:50
Rochester.....8:00	9:20		2:05	4:35		9:00

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7. " muricatum, 1½inch single valves 1
8. " serratium, 1 to 2½ inch..... 3
9. Arca ponderosa, 2 to 3 inch..... 3
10. " noæ 1 to 4 inch..... 3
11. " floridanum, 2 to 2½ inch..... 3
12. Cytherea (callista) gigantea, 3 to 5 inch...10
13. " " maculata, 1 to 2½ inch 6
14. Natica duplicata, 1 to 3 inch 2
15. Chama Arcinella, 1 to 2 inch..... 5
16. Dosinia discus, 2 to 4 inch 5
17. Pholas costatus, 3 to 6 inch, double valve...15
18. Murex pomum, 1 to 3 inch..... 3
19. " salleanus, 1 to 3 inch 5
20. Pyrula papyratia, 3 to 5 inch 8
21. Pecten exasperatus, ½ to 3 inch, single..... 1
22. Conus Floridanus, ¾ to 1 inch 2
23. " proteus, 1 to 3 inch..... 10
24. Pinna muricata, 4 to 10 inch 8
25. Lucina edentula. 1½ to 3 inch. single 2
26. Cancellaria carolinensis, 1 to 1½ inch..... 3
27. Oliva litterata, 1 to 2½ 2
28. Anomia ephippium, 1 to 2½ inch..... 1
29. Melongena subcoronata, 2 to 6 inch..... 8
30. Cerithium eburnum, 1 to 1½ inch 3
31. Turritella, 1 to 1½ inch..... 2
32. Tellina, ½ inch..... 1
33. Marginella, ¼ inch..... 2
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36. Conch spawn ribbon 18 inch to 2 feet..... 20
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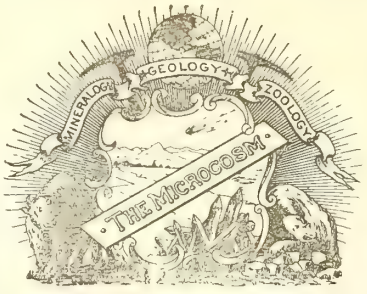

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An Easter Edition

OF 25000 COPIES OF THE

Natural Science News

Will be printed during the latter part of March and mailed not later than April 10th.

A copy will be mailed to every know Naturalist and Curio Collector in in America and to over 1000 selected live ones in Foreign countries.

ADVERTISING RATES will be advanced for this Easter edition as follows:

WANT, EXCHANGES and FOR SALE Notices will cost **50cts per 35 words**, 1c per each additional word each figure counting as a word.

Coupons given with subscriptions will be honored in payment for notices in these columns in the Easter edition at 25cts each.

ADVERTISEMENTS will be taken at,

10 cents per nonpareil line. 12 lines per inch.
120 lines per column. 360 lines per page.

The minimum price for a single advertisement in the Easter edition will be 50c. A 5 line advertiesment or under will cost that amount.

Not to exceed one full page of space will be accepted from any single person or firm.

NO DISCOUNTS will be allowed at this, less than nominal, rate. Hence a

5 line or less advertisement will cost $ 50
12 line (1 inch) advertisement will cost $1 20.
60 line (½ col.) advertisement will cost 6 00.
120 line (1 col.) advertisement will cost 12 00.
180 line (½page) advertisement will cost 18 00.
360 line (1 page) advertisement will cost 36 00.

Cash Must Accompany Order

Unless you have a satisfactory rating with either Dun's or Bradstreet's Commercial Agency, or can give me satisfactory Bank Reference, or have already had sufficient dealings with me to satisfy me of your financial reliability, the cash must accompany your order. If, however, you have either of the above three requirements and your order is for space amounting to over $2.00 I will neither require nor ask for a single cent's pay until I prove to you

1st—By my printer's affidavit that I have issued 25,000 copies of the Easter edition of NATURAL SCIENCE NEWS.

2d—By my P. O. postage receipts that I have mailed at least 20,000 of the number.

Rates to regular advertisers WILL NOT BE ADVANCED. I will not, however, allow them to use more than the *average* number of lines which they agree to use in each issue for the entire year at this heavy loss to myself. Should they wish to increase the size of their regular advertisement, however, they can do so at the regular rate, for this issue, of 10cts per line.

First and Last Pages

Are always considered more desirable by many, although the Publisher knows that *every* page in this issue will be "religiously" read. However, if YOU consider the first or last page preferable and are willing to back your preference with the "price," I will sell the space on these pages as follows:

On the first page: Small "Want, Exchange and For Sale" advs. on FIRST PAGE will cost $1.00 per notice of 35 words or under. Exceeding 35 words, 3 cts per each additional word.

The Last Page will be sold to a single party or firm and will not be divided. My price for the same will be $50 net.

This Easter issue is sure to prove a "howling success" and it is my desire to have YOU "in t" and share in the fruits thereof.

Expecting to hear from **you** at an early date, providing you wish to share in the success of the issue, I remain, as ever

Faithfully,

FRANK H. LATTIN, Publisher, ALBION, N. Y.

Natural Science News.

VOL. II. No. 3. ALBION, N. Y., FEBRUARY 15, 1896. Weekly, $1.00 a Year

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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Albion, Orleans Co., N. Y.

Entered at Albion P. O. as 2nd lass mail matter

Mammoth Cave.

(CONTINUED.)

Audubon's Avenue lies nearest the entrance. It is chiefly noted for its myriad of bats, and for the fact that it leads to an opening into which a miner dropped his lamp in 1812. Mat, the guide, found it thirty years afterward at the bottom of Mammoth Dome.

The Gothic Arcade is approached by a stairway from galleries beyond the saltpetre vats. The chapel in the Gothic Arcade has an arched roof supported by large stalagmitic columns, once beautiful but now sullied by sacrilegious smoke. I counted eight and found fragments of about thirty more. The growth was slow, requiring many centuries to develop their present dimensions. Three of the pillars are so grouped as to form two Gothic arches. Before this unique alter once stood a runaway bride, who had promised her anxious mother that she would "never marry any man on the face of the earth," She kept the letter of her promise, but was married after all to the man of her choice in this novel Gretna Green. We were fortunate in witnessing a similar scene, another of which is to be enacted this fall by a romantic young couple.

This avenue is about two miles long, and abounds in grotesque curiosities. It ends in Annette's Dome, where a cascade surprises one by bursting from the wall and then disappearing. Lake Purity, near by, is a shallow pool of such transparency that we did not suspect its existence until we walked into it.

Retracing our steps, we soon approach a region of pits and domes. The guide warns us of "danger on the right!" Beside our path yawns a chasm called the Side-saddle Pit, from the shape of a projecting rock, on which we seat ourselves and watch with fearful interest the rolls of oiled paper lighted by the guide and dropped into the abyss. Down they go in a fiery spiral, burning long enough to give us a view of its corrugated sides and a mass of blackened sticks and timbers a hundred feet below, remnants of a bridge once spanning the chasm.

The Bottomless Pit, a short distance beyond, is on a still grander scale, and extending, as it does, entirely across the avenue, was long an effectual bar to further progress. It is now spanned by a substantial bridge, which, for the sake of perfect safety, is renewed every year. Leaning over the handrails, we safely admired the blazing rolls as they winded to and fro, slowly sinking one hundred and seventy-five feet, lighting up the wrinkles and furrows made by the torrent's flow during untold ages. Shelby's Dome overhead is but a continuation of the great pit upward, with rich water-carved scrollwork and lavishly decorated panels, and here and there a sharp projection.

Turning abrubtly back, we follow the guide up and down narrow stairways and through a winding passage, till we find ourselves peering through a window-like aperture into profound darkness, that seems intensified by the monotonous sound of dripping water. The guide bids us remain where we are while he seeks a smaller and higher window beyond, through which he thrusts blue lights and blazing rolls, disclosing indescribable wonders to our gaze. This is Gorin's Dome. The floor far below us, about an acre in area, is covered, with water. The perpendicnlar walls, rising out of sight, are draped with these immense stalagmitic curtains, one above another, whose folds, which seem to be loosely floating, are bordered with fringes rich and heavy. These hangings, dight with figures rare and fantastic, fit for Plutonian halls, were woven in Nature's loom by crystal threads of running water.

We have now no choice of evils between Bunyan's Way, where one must stoop like a pilgrim burdened, and Buchanan's Way, where one must hold his head to one side, after the traditional habit of that eminent statesman. We choose the latter; and presently, by a circular opening over which hangs a threatening trap-door of rock, we are made acquainted with the famous and original Fat Man's Misery, of which all others are but base imitations. It is a serpentine channel, whose walls, eighteen inches apart, change direction eight times in one hundred and five yards; while the average distance from the sandy pathway to the ledge overhead is but five feet. The rocky sides are beautifully marked with waves and ripples, as if running water had been suddenly petrified. There seems to have been first a horizontal opening between two strata of limestone, by taking advantage of which this singular winding way was chiseled, from whose embrace we gladly emerge into Great Relief, where we can straighten our spines, and enjoy the luxury of a full breath. It was formerly supposed that if this passage were blocked up, escape from the regions beyond would be impossible. But not long ago the "Corkscrew" was discovered, an intricate web of fissures, by means of which a good climber, after mounting three ladders, crawling through narrow openings, and leaping from rock to rock, ascending thus amid the wildest confusion for one hundred and fifty feet, gains a landing at last, only a thousand yards from the entrance to the cave, and cuts off two or three miles of travel. Visitors generally come in the regular route and go out the Corkscrew, which, with a lively party, affords no end of amusement and a world of happy experiences which one recalls with pleasure years after. None should fail to come through the Corkscrew.

On entering River Hall we found our path skirting the edge of cliffs sixty feet high and one hundred feet long embracing the sullen waters of what is called the Dead Sea. Descending a flight of steps we came to a cascade, but a little further on, said to be a re-appearance of the waterfall at the entrance, suggesting the idea that the cave

has doubled on its track. Passing the River Styx and Lake Lethe, we come to Echo River. Four boats await us on the banks. Each has seats on the gunwales for twenty passengers, while the guide stands in the bow and propels the primitive craft by a long paddle or by grasping projecting rocks. The river's width varies from twenty to two hundred feet, and its length is about three quarters of a mile.

The low arch soon rises to a height varying from ten to thirty feet, while the plummet shows a still greater depth below. The river can not properly be said to have any shore, for throughout its entire extent there are only one or two points where a foot-hold could be gained. Hence, the guide exercises the strictest authority in order to guard against accidents.

Along the water's edge are cavities, varying in size from a few inches to many feet, washed out by the stream. A quiet lady in black velvet led us in a sacred song. The concord of sweet sounds was surprisingly agreeable; but the tones followed each other too rapidly to secure full justice. A single aerial vibration given with energy, as by a pistol shot, rebounded from rock to rock. The din awakened by discordant sounds was frightful. On the other hand, when tne voice gave the tones of a full chord *seriatim*, they came back in a sweeping *arpeggio*. Flute-music produed charming reverberations. The finest vocal effect followed the utterance, as strongly and firmly as possible, of the key-note of that long vault, letting all other sounds meanwhile cease; the wonderful vibrations thus caused were prolonged for from fifteen to thirty seconds after the original tone had been delivered.

An extraordinary result was obtained by the guide's agitating the water vigorously with his broad paddle, and then seating himself in silence by my side. The first sound that broke the stillness was like the tinkling of silver bells. Larger and heavier bells then seemed to take up the strange melody, as the waves sought out the cavities in the rock. And then it appeared as if all chimes of all cathedrals had conspired to raise a tempest of sweet sounds. They then died away to utter silence. We still sat in expectation. Lo, as if from some deep recess that had been hitherto forgotten, came a tone tender and profound; after which, like gentle memories, were re-awakened all the mellow sounds that had gone before, until River Hall rang again.

This concert was prolonged for several minutes, until the agitation of the waters had wholly subsided. Those who try their own voices are pleased to have the hollow wall faithfully give back every shout and song, whimsical cry or merry peal; but the nymphs of Echo River reserve their choicest harmonies for those who are willing in silence to listen to the voice of many waters.

Continuing our journey by way of Silliman's Avenue and El Ghor, picturesque passes where many fantastic objects are pointed out, we arrive at Hebe's Spring. Here, by climbing a ladder and crawling through a hole in the roof, we are admitted to an upper tier of caverns. The guide ignites blue fire, and we are surprised to find ourselves in a vineyard! Countless nodules and globules simulate clusters on clusters of luscious grapes, burdening hundreds of boughs, and gleaming with parti-colored tints through the dripping dew.

Washington Hall is but a smoke-stained lunch-room. The ceiling of a room near by is dotted with semi-spherical masses of snowy gypsum, each of which is from two to ten inches in diameter, looking like a snow-ball hurled against the wall and sticking there. Snow-ball Room is a fitting vestibule to the treasure-house of alabaster brilliants beyond it, where we tarry long with ever-increasing delight.

What words can picture forth the beauty of Cleveland's Cabinet? Wyandot and other caverns may have galleries like it in kind, but none to be compared with it either in extent or symmetry. We loiter beneath spotless arches of fifty feet span, where the fancy is at once enlivened and bewildered by a mimicry of every flower that grows in the garden, forest, or prairie, from the modest daisy to the flaunting helianthus.

Beyond a rocky hill and a dismal gorge lies Croghhan's Hall, and a pit called the Maelstrom, which ends the Cave so far as it has been explored in this direction.

Tourists have usually been hurried through by two routes, one requiring four hours and the other nine, and both covering about twenty-eight miles of travel in and out. A season ticket is now for sale allowing parties a more leisurely exploration, and good for entrance for thirty days.

On the whole, Mammoth Cave greatly exceeded, though differing from our expectations. We were grateful, however, for impressions received and memories retained of wonderful scenes and strange adventures. Feelings akin to friendship had sprung up within us for Mammoth Cave; and it was with positive regret that we finally turned away from the fern-fringed chasm, lying there in the soft moonlight, where the sparkling cascade throws pearly drops from the mossy ridge, and spreads its mist like a silver veil.

The White Elephant Kedah.

White elephants have for many years been an object of veneration in Burma and Siam. The fortunate individual who found a white elephant in his possession sold it to the king of one of those countries, obtaining therefor, it is said, certain titles to nobility, exemption from taxation and from capital punishment and a sum of money determined, it is said, in some cases, as the amount of silver coin which he could push along a smooth surface with his little finger. The largest sum ever obtained, it is said, was won by a Chinaman, who assiduously practiced pushing weights, strengthening his hand so as to be able to push along the largest amount of silver possible. Some years ago a partially white elephant was in the Barnum & Bailey show, which animal perished in the Bridgeport fire. There has been recently imported into this city, by the firm of DeSilva and Gaylord, a perfect example of the white elephant.

The sacred beast is recognized by certain signs. In addition to the light color of his skin, he was required to have five white hoofs on each foot, he had to show a pink color about the ears, and the hair about the lip was required to be light in color, and the tail to have no tuft of hair upon its end.

The animal was caught wild near Palembang, in Southeastern Sumatra, on June 17, 1895, and is supposed to be about eighteen months old. Its height is three feet nine inches and it weighs about five hundred pounds. The little creature is perfectly docile and content in its captivity and allows itself to be fondeled and played with at liberty. It has been named Kedah. In Sumatra the value of the white elephant is not generally known, and the captors of this animal were not aware that they could have

sold it to the King of Siam. Had it been found by those having knowledge of this fact, it would probably never have left the East. It is really the only elephant which truthfully can be called white ever brought to this country. Europe has never possessed one of any kind.

White elephants are now only to be seen within the enclosure of the King's palace at Bangkok, Siam. There are four there now, which animals, owing to the peculiar religious tenents of the Buddists' faith, are absolutely unpurchaseable. The doctrine of the transmigration of souls teaches that these animals are inhabited by the souls of Siamese kings.

The white elephant which was with the Barnum & Bailey show was procured with great difficulty by Mr. Gaylord, in Burma. The present animal of the Sumatran variety, an absolutely perfect example of the elephant albino, is one of the most interesting and curious zoological specimens ever brought to this country. The color is a very light gray, and the skin is peculiarly soft and delicate. About the end of the trunk and about the ears it runs into a light pink tint, and the hoofs are a beautiful cream white. The animal is male, and is expected to attain a height of seven to eight feet.

Its importer, Mr. J. B. Gaylord, has spent many years in collecting animals for exhibition, having in the course of his experience gone twenty-two times arouud the globe. He brought Kedah home by sea through the Suez Canal, the journey taking fifty days. Kedah arrived rather thin and worn after its trip, but is now in prime condition and bids fair to attain a good old age.—*Scientific American.*

The Fragrant Shield Fern.

I had another gala day this season when with the help of a friend I found the last of our New England ferns—Dryopteris fragrans. I have spent a good many hours among our cliffs during these ten years past, hunting for this little fellow, and had given up expecting to find it. Several times I had thought it found, but it would prove to be only the Woodsia Ilvensis. There could be no possible question this time as to its identity. It was way up on the bare, dry face of the cliff, far out of reach except by some sort of a ladder. But it was so unlike any other species, with its dry, curling, snuff colored fronds of last year, that I knew it was the one I wanted. We found more of it later that was accessible. I think that the professors who have written our description of it have never found it for themselves. Its chief characteristics are: 1st—that peculiar appearance of the old fronds; you couldn't curl them more gracefully than they appear dropping over the ledge of rocks. 2nd—the glutinous fronds, they cannot be taken from the paper until they are dry and grass and leaves adhere to them. 3rd—its peculiar fragrance. Gray says "aromatic;" that doesn't half tell the story. I gathered a clump of it on the cliff and dropped it down in my pocket handkerchief, and the perfume lasted for days. I think it is like new-mown hay composed largely of sweet briar rose leaves. Its fragrance alone makes it our best fern. It grows on the dryest cliff sides, where everything else would be scorched by the sun's heat; not "especially near water-falls," as Gray's Manual says. Look for a place where there is a bare cliff, overhanging a little perhaps, so that the rain cannot reach it, and up above all the trees, so that it can have no shade at all, and if you find a fern there, test it by the perfume, its stickiness and its beautiful brown curls.—*James A. Bates, Randolph, Vt., in The Fern Bulletin.*

Peculiar Nesting Sites.

Sometimes birds select such unusual sites to build their nests that we may wonder why they do so when there are plenty of natural sites in the locality. There is a large deep gulley which runs at right angles from Keuka Lake and in some parts of this gulley are perpendicular banks of slatestone but mostly covered with large coniferous trees.

Projecting from one of these bare slatestone banks there is a narrow ledge or shelf of rocks which is about 100 feet from bottom of valley and 35 feet from top. Above this ledge the bank is covered with moss, ferns and shrubs, while below it is bare and concave.

It was in the middle of May, 1889, that I first noticed this shelf, and out of curiosity I let myself down upon it by holding onto some firm roots which protruded from the bank, when lo! I discovered that I had dropped into a Great Horned Owl's nest and there sat a young Donwy Bubo trying his best to stare me out of countenance. No attempt had been made to build a nest—merely a depression in the loose pieces of slatestone. In a crevice near the nest there was stuffed a Ruffed Grouse which was fresh and about half eaten.

Another peculiar site was selected by a pair of Chimney Swifts down in a well 10 feet from top of curbing and the nest being glued onto a smooth hard stone and contained a family of five. I removed the curb which was a box affair about 3 feet square and went down to examine the nest. While doing so the parents made frantic efforts to reach their dusky children by diving with the speed of an arrow into the misplaced curb. I afterwards learned that the young birds got out safely. Date of finding nest July 14, 1895.

Again on July 25, 1895, I discovered another nest of Chimney Swift in the garret of flour mill where noisy cog wheels and rumbling machinery keep up an incessant racket. Yet these plucky birds glued their nest to the board siding and reared a family of five. How they ever darted into the small opening in the peak of mill without getting caught in belts and cog wheels is a mystery to me. It may be of interest to add that although the ever-present English Sparrow enters this same hole to feed on the grain scattered about. They did not disturb the Swifts in any manner. Nor have the English Sparrows ever attempted to build nests in the garret although there are thousands of them here.

C. F. Stone,
Branchport, N. Y.

Field Days in the Foothills.

August 3d. Despite our intention of oeing up early this morning, it was 7 o'clock when I awoke. M. was still in the arms of "Morpheus," but with a little gentle persuasion he arose, and after performing our "toilet" at a small stream that ran past the "shack" we swallowed a hasty breakfast and after seeing to the horse and making everything ready we left for a day's collecting.

We followed a cattle trail for about two miles, observing no bird life of any amount, with the exception of several White-crowned Sparrows which no doubt breed in that locality.

After a little hard climbing we arrived at the top of a hill and the scene that burst upon us was glorious, a regular panorama of hills and valleys with a creek winding north and south and fully 200 feet below us.

It did not take us very long to scramble to the bottom of the hill and cross the creek, in which I noticed the trout rising hungrily at the flies. M. fortunately had some fishing tackle and we resolved to have some fresh fish for supper on our return journey.

Several Sparrow Hawks were screeching noisily and we passed through a patch of pine bush I noticed several Red Squirrels. I shot a pair to preserve and found them smaller and darker than the eastern variety.

We now commenced to climb a big hill, a sort of miniature mountain, at the top of which I thought we might find the Grouse. The first half of the way was pretty "tough," scrambling over logs and through brushwood; but as we neared the top the vegetation grew scantier and rocks were plentifully strewn around. We arrived at the top thoroughly "blown" and after a rest commenced to hunt the ridge. I had not gone far before M. shouted to me to come and look a some feathers which he picked up. There were two of them, a primary and tail feather, belonging without a doubt to the bird we were seeking, the "Blue Grouse." This was encouraging and we started to hunt with renewed hope, fingers on the trigger, should a bird jump suddenly.

To make a long story short, we hunted the ridge from end to end but never saw a bird. Several more feathers were found mostly in raspberry patches which seem to be the only vegetation that thrives amongst the stones. I have no doubt the birds feed on the berries in the early morning and spend the middle of the day in the valleys, according to the time and locality we secured our specimens. We commenced to descend the hill with the prospects for Grouse as far away as ever, M solemnly vowing that he would bring the dogs another time "Wolf Poison" or not.

Rocky Mountain Chipmunks were numerous and I collected a good series. They are like the Red Squirrel, smaller and much darker in color than the eastern variety. We reached the bottom of the hill in much quicker time than it took to ascend and began to make our way across the valley to the creek.

I was walking in front of M. with the hammers of my gun down and not giving much thought to the Blue Grouse, when suddenly there was a "whir" like a sky rocket almost under my feet and a bird started away at a great pace. By the time I had pulled myself together the bird was a long way off, but M. yelled at me to shoot and as a sort of forlorn hope I pulled the trigger and was agreeably surprised to see him turn over and drop in the grass. Folfowing the report of my gun there was a much more decided "whir" and a much larger bird flushed within easy range and was "bagged" without any difficulty. The former was a young bird of the year, well fledged and strong on the wing. The latter was the female and they were both eventually identified as *D. obscura Richardsonii*. As I expected we were amongst a brood. I cautioned M. to look out and we quartered the ground carefully. However, only one more bird was flushed and I gloriously missed him. It took us quite 20 minutes to find the first bird in the long grass, another reason why we should have had the dogs M. suggested.

After attending to these two specimens we started again in much better spirits and fully on the alert for any more Grouse. However we arrived at the creek without seeing another feather and set about securing some trout for supper. We quickly rigged up some tackle that would have made me blush in more civilized regions. and in about as many minutes we hauled out 23 fish. I doubt if the stream had ever been fished in before; at any rate the fish simply fought for the bait—we used grasshoppers—and as soon as it touched the water three or four fish would rush at it savagely. It was the best bit of fishing I have ever had. The fish were all mountain trout from 3 to 8 ounces in weight and splendid eating.

We arrived at the "Shack" about 7 p. m., thoroughly tired but were satisfied with our two Grouse, and after a good supper of trout we turned in for the night.

August 4. It was 8 a. m. before we awoke this morning and as I had plenty to do for some hours in preparing the specimens obtained on the previous day, M. said he would go out alone promising to be back by noon. It was just 5 p. m. when M. returned. He had secured another female *Richardsonii* which he informed me had jumped up on a log and sat looking at him until he threw a stick at her when she flew off. During the absence of M. I had prepared a dish which it would tax even Delmonico to procure, i. e., Richardson's Grouse Pie, to which we did ample justice.

As we sat outside the "shack" enjoying a pipe just as the "shades of night were falling fast" a Great Horned Owl came and perched on a tree right overhead. I rose to get the gun and in so doing cracked a stick and "Bubo" vanisned like a ghost. Nighthawks were numerous and I presume they breed on the ridges.

Tomorrow was to be the last day, so we turned in for another good night's rest.

August 5. We were up by 6 a. m. this morning and after refreshing the inner man we started to explore the pine bush behind the "shack." We had not gone fifty yards before I saw (or rather heard and then saw) four Canada Jays. They proved to be very wild but eventually M. got within range and brought one down with a broken wing which commenced a tremendous outcry. The remaining three would not leave their fallen mate, and we secured the four easily. Three were birds of the year and the other a mature male.

A Horned Owl was the next to attract our attention and it was whilst in pursuit of this bird, that I secured the prize of the day. I was cautiously approaching to where "Bubo" had flown when I heard a tapping above my head and upon carelessly glancing up was astonished to see a little black bird with white bars on the back vigorously digging into a rotten branch. A small charge of No. 12 brought it tumbling down and it proved to be a female American Three-toed Woodpecker (*P. Americanus*). I had never thought of finding this species so far south in summer and presume that they breed in the locality.

Deer tracks were very numerous and also quite a few bear signs were seen. The grizzley is found in this country but fortunately we did not come across one. Nothing more of importance was secured. We collected specimens of Olive-sided Flycatcher, Red Squirrel, and Rocky Mountain Chipmunk. Several Horned Owls were seen but managed to keep out of gunshot.

We returned to the "shack" by noon and after dinner packed up our effects and prepared to leave. Upon proceeding to bring in our horse "Billy" I found him amongst a cloud of Bulldogs as the large horse flies are called. They are a pest to horses and cattle in the summer months but fortunately do not take so much interest in the human race, although I have often been bitten by them and they make the blood flow

After carefully packing our effects and the specimens we fastened up the door of the "shack," nailed up the window and then taking our seats in the buckboard we bade adieu to one of the prettiest localities I have ever visited.

We reached the "ranchers'" place again before sunset and stayed there over night, resuming our journey the following morning, arriving in Calgary at 3 o'clock in the afternoon. Just outside the town I shot a splendid Ferrugineous Buzzard in the black (melanistic) plumage and another one in the normal phase. These birds are easily shot out of a buckboard, but it is almost useless to try and approach them on foot. I also secured specimens of Say's Phœbe and the Arkansas Kingbird on the return journey. Both are fairly common around Calgary.

Clyde L. Smith of Oblong, Ill., writes that on the 18th of September he collected a set of two eggs of the Mourning Dove, incubation advanced about one-third.

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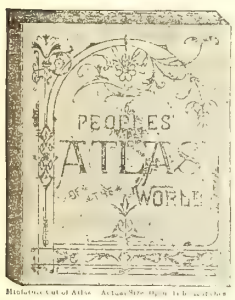

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Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

SKINS and MOUNTED BIRDS, for sale or will give for good exchange in desirable sets or singles with complete data, or ornithological publications. Correspondence solicited. A. P. and A.P.& D. J. SIMMONS, 611 Jacob St., Troy, N. Y. O.

PARADISE FOUND:—Since my exchange notice in No. 52 I have returned to Birdland. Birds and eggs for cash or good exchange in books and magazines. R. H. ROCKWOOD, Orono, Maine.

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Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:50
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion..... ....6:50	8:15		1:00	3:05	6:45	7:50
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29	Melongena subcoronata, 2 to 6 inch	8
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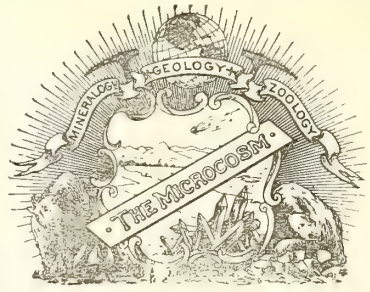

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VOL. II. No. 4. ALBION, N. Y., FEBRUARY 44, 1896. Weekly, $1.00 a Year

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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Infusorial Earth and its Uses.

It is one of the paradoxes of Nature that the smallest creatures contribute most to the structure of the earth. The higher forms of life are barely traceable in the rocky strata; the lowest make up the bulk of vast formations, thousands of miles in area, thousands of feet in depth. The gigantic labors of the minute but multitudinous coral polyps are proverbial: but these are surpassed by the remains of still more microscopic creatures which swarm in all waters, arctic as well as tropical, fresh as well as salt, and whose cast-off shells fall like a ceaseless rain of solid matter on every part of the ocean's bed, on the beds of every inland, sea and lake, every river, and marsh, and roadside pool. And minute though they be, the bulk of matter they contribute to the earth's strata every year is quite incalculable. The celebrated microscopist Ehrenberg, the first to realize their importance, estimated that in the single harbor of Wismar, in the Baltic Sea, as much as eighteen thousand cubic feet of these silicious organisms accumulated annually. The deep sea explorers of the Challenger expedition found them everywhere above the depth of two thousand fathoms; and below that their insoluble remnants made up thousands of square units of "red clay" deposits, apparently the stuff from which the azoic bases of the continents were formed. The limestones and chalks derived from calcareous infusoria are still more abundant and important: and by no means insignificant are the unconsolidated silicious strata of modern origin, to which the name infusorial earth has been applied. The stratum at Bilin in Bohemia, in which Ehrenberg found the enormous number of forty thousand millions of individuals to the square inch, is eighteen feet thick, and extends over a large area. At Lunenberg is another deposit, nearly twenty-eight feet thick; and less important strata are found in other parts of Germany and throughout Europe. In Lapland and Sweden it constitutes the well known "mountain meal," used to swell the bulk of certain foods. Many deposits of considerable magnitude are known in England, and the Irish beds are celebrated, especialty those of the county of Down. Africa for a long time monopolized the supply for use in the arts, and furnished the familiar name Tripoli. The material is now abundantly supplied by other parts of the African continent, by Asia, Australia, New Zealand, South America, our own country—indeed every part of the world. In South America, the natives count it in some parts an essential portion of their diet, using it as food mixed with fat. Along the Amazon, beds of this useful earth are numerous; and since the organisms which produce it are universally distributed, the deposits of it will doubtless be found more or less abundant everywhere when sought for. Such at any rate appears to be the case in this country. The extensive deposit at Drakeville, N. J., which so conveniently supplies a demand originally met by material imported from Germany, for the manufacture of dynamite, is a case in point. Perhaps the most extensive deposit in this country is the one underlying the city of Richmond, Va., a deposit which Professor Rogers traced from a point on Chespeake Bay, in Maryland, to beyond Petersburg, Va., where it is thirty feet thick. Beds of similar character have been found in California, Oregon and elsewhere on the Pacific Coast; and smaller deposits occur at West Point, at Wrentham and Andover, Mass., and in Connecticut and Rhode Island.

Infusorial earth, or tripoli, is best known as a polishing powder for gold, silver, etc., for which purpose it has no rival. Mention has already been made of its use in the manufacture of blasting powders, in which it serves the useful purpose of holding the explosive nitroglycerin. But these will ultimately be counted among the least of its uses. Already it plays an important part in the manufacture cements and artificial stones, especially in Ransome's process. Combined with carbonate of magnesia, it forms the excellent cement known in Germany as albolite. With borate of lime, it forms a valuable glazing for furnaces, pottery, etc., and is found very useful as an enamel for iron and slate. Fused with borate of magnesia, it forms a beautiful and durable porcelain which can be cast and even blown like glass. A multitude of minor uses have been suggested, and many more will no doubt follow as our artisans become acquainted with its properties. Its lightness, indestructability by fire, and slowness of heat conduction are qualities of very great value. Bricks of it, with a little clay, are nearly as strong as common bricks, yet so light as to float on water. At the same time they are infusible, and such poor conductors of heat that they may be held at one end while the other is heated to redness. As an experiment, an Italian engineer constructed the powder magazine of a wooden vessel with such bricks, and when set on fire the vessel burned till she sank, without exploding the powder. The lightness of such fireproof bricks makes them specially valuable for such uses. They have also been used to advantage in the construction of reverberatory furnaces, pyrometers, etc. The heat-resisting quality of infusorial earth makes it not less useful as a protection to ice bins, ale cellars, etc., and as a lining for fireproof safes and the like, for which purposes it is rivaled only by asbestos. Agriculture furnishes another promising field for the use of infusorial earth. Professor Wilson, who has the honor of discovering the use made of this form of silica by plants, pronounces the application of it to fertilizing purposes the most important adaptation of matter for the reproduction of vegetation that has even been discovered. There can be no question of the importance of such assimilable silica to soils like those of Bermuda, where the silicious element is nearly if not entirely wanting.—*Scientific American.*

The Scorpions of Egypt.

That indefatigable naturalist, Mr. Frank Buckland, gives the following account of a fight between a mouse and a scorpion:

"In February, 1868, I received a box by post containing two live scorpions, kindly presented to me by my friend, the late lamented J. Keast Lord, who had caught them under a stone at Heliopolis, in Egypt. Wishing to test the power of the scorpion's sting, I got a glass globe and turned in one of the scorpions. A mouse having been caught in the trap, I thought I might just as well let the scorpion try his powers upon it as the cat. I therefore shook the mouse into the glass with the scorpion. The scorpion, an average-sized one, immediately resisted the affront; and the mouse, who had never evidently seen a scorpion before, did not know whether he was his friend or his enemy. Not liking the continued jumping of the mouse, the scorpion twisted and began brandishing about his sting. The mouse shortly crossed his path. The scorpion instantly lunged his sting into him. This challenge instantly woke up the mouse, who began to jump up and down like a jack in the box. When he became quiet, the scorpion again attacked the enemy, with his claws extended like the pictures of the scorpion in the zodiac. He made another shot at the mouse, but missed him. I then called 'Time!' to give both combatants a rest. When the mouse had got his wind, I stirred up the scorpion once more, and, as 'the fancy' say, 'he came up smiling.' The mouse during the interval had evidently made up his mind that he would have to fight, and not strike his colors to a scorpion as he would to a cat. When, therefore, the scorpion came within range, the mouse gave a squeak and bit him on the back; the scorpion at the same moment planted his sting well between the mouse's ears on the top of his head. The scorpion then tried to retreat, but could not, for one foot had got entangled in the fur of the mouse. The mouse and scorpion then closed, and rolled over each other like two cats fighting, the scorpion continually stabbing the mouse with his sting, his tail going with the velocity of a needle in a sewing machine. When the scorpion got tired, the mouse got hold of his tail with his teeth and gave it a sharp nip. The mouse seized the opportunity, and immediately bit off two of the scorpion's side legs. He then retired, and began to wash his face. I had expected, of course, that the poison of the scorpion would have killed the mouse, but he didn't seem a bit the worse for it. When I examined him the next morning he was quite lively and well; and had nearly eaten up the whole of the scorpion for his breakfast. Of course I rewarded the mouse for his plucky conduct by giving him some milk, and by letting him go in a place where it was not likely the cat would find him.

"Scorpions are inhabitants of hot climates; they live among stones, logs of woods, etc., in such places, in fact, as those inhabited in England by wood lice and centipedes, etc. They are said to attain the length of twelve inches in Batavia; and along the Gold Coast, I have heard (but hardly believe it) they are found as a good sized lobster; the general size is about three inches long. It not unfrequently happens that scorpions are brought to England in timber ships, etc., and I have received more than one scorpion thus brought over."

The Amœba.

The amœba is one of those singular forms of animal life which seemingly occupy the extreme boundary between animal and vegetable life. In an article attempting to set forth the distinguishing points between animal and vegetable life, the *London Quarterly Review* gives the following description of this most remarkable of living creatures:

"But perhaps the clearest instance of the uselessness of attempting to make the possession of a stomach a distinctive feature of animal nature is shown by the history of a group of creatures, of which the well-known and common amœba may be taken as a type. In these there can be no question of definition, for in no sense whatever can they be said to possess a permanent stomach.

"The amœba has a just claim to the title of animal, for its affinities with the foraminifera are clear; and no one would deny that these creatures, with their exquisitely beautiful shells, are animals. Nor is this position shaken by the fact that the life history of the amœba can at present be said to be fully made out. Yet the amœba has no stomach, possesses indeed no organs at all, unless we consider its so-called nucleus as one; and there are closely allied forms in which even this is absent. Conceive of a minute drop of transparent jelly, so small as to be invisible without the help of a microscope, a drop of jelly sprinkled and studded with a dust of opaque granules, sometimes hiding in its midst a more solid rounded body or kernel called the nucleus, and perhaps with the outer rind a little different from the internal mass. Conceive further of this amœba as of no constant shape, but like the Empusa shifting, as we look upon it, from one form into another. At one moment it is like a star with straggling unequal limbs, at another club-shaped; now it is a rounded square, soon it will be the image of an hour-glass. None of these changes can be referred to currents in the water in which it lives, or to any other forces acting directly upon it from without. It seems to have within it some inner spring, an inborn power of flowing, whereby this part of it or that moves in this or that direction. And not only do its parts thus shift and change in form, but through their changes the whole body moves from place to place. As we begin to watch it, for instance, at the moment when it is in what may be called its rounded phase, a little promberance may be seen starting out on one side. Speedily the little knob swells, lengthens, flows into a long process. The process thickens, faint streams of granules indicating in which way the currents of the unseen molecules are setting. The substance of the body surges into the process; and as the latter widens and grows thick, the former shrinks and grows small. At last the whole body has flowed into the process; where the body was there is now nothing, and, where the process reached to, the whole body now is. The creature has moved, has flowed from one spot into another. Here, then, we have movement without muscles, locomotion without any special organs of locomotion. We have also feeling without nerves or organs of sense, for if a process such as we have described, while flowing out, meet with any obnoxious body, it will shrink back and stop in its work. And the whole body, terrified by some potent shock, will then gather itself up into a ball. As it moves without muscles, so also does it eat without a stomach. Meeting in its sluggish travels with

some delicious morsel (and diatoms are its frequent food) it pours itself over its meal, and coalescing at all points around it, thus swallows its food by fluxion. To use a homely illustration it is much as if a piece of living mobile dough were to creep around an apple and to knead itself together into a continuous envelope in to form an apple dumpling. Watching the food thus enveloped by the gelatinous substance of the amœba we see it grow fainter and fainter as its nutritious constituents become dissolved by the corrosive action of the same transparent but chemically active jelly; and when all the goodness has been got out of the meal the body of the eater flows away from the indigestible remains in just the same way that it flowed around the original morsel.

"We have in this creature, then, eating without a stomach, moving without muscles and without limbs, feeling without nerves, and, we may add, breathing without lungs, and nutrition without blood. The amœba is a being of no constant outline, of no fixed shape, which changes its form according to its moods and its needs, and turns its outside into its inside whenever it pleases, which is without organs, without tissues, without unlike parts, a mere speck of living matter all alike all over. And yet in the midst of this simplicity it enjoys all the fundamental powers and fulfills all the essential duties of an animal body, and is, moreover, bound by chains of close-joined links with those complicated forms of animal life which are provided with special mechanisms for the most trifling of their wants.

"The dormant capabilities of this organless being are indirectly and interestingly shown by the shells, which, in allied forms, are built up by the agency of similar homogeneous living matter, and which are in many cases 'structures of extraordinary complexity and most singular beauty.' Professor Huxley in his lectures most justly says:

"'That this particle of jelly is capable of combining physical forces in such a manner as to give rise to those exquisite and almost mathematically arranged structures—being itself structureless and without permanent distinction or separation of parts—is, to my mind, a fact of tne profoundest significance.'"

Arctic and Antarctic Oceans.

Among the navigators and scientific men of former times it was disputed whether salt water was capable of being frozen. Experience—in many cases a stern teacher—has set that question at rest, proving that within the polar circles the sea is, for hundreds of miles, covered with masses of ice, which form a sullen, unyielding barrier to the poles. Maury describes the agencies at work in these terrible solitudes in a famous passage: "There icebergs are framed and glaciers launched; there the tides have their cradle, the whales their nursery; the winds complete their circuits, and the currents of the sea their round in the wonderful system of oceanic circulation; there the aurora is lighted up, and the trembling needle brought to rest; and there too, in the mazes of that mystic circle, terrestrial forces of occult power and of vast influence upon the well-being of man are continually at play. Within the arctic circle are the pole of the winds and the poles of the cold; the pole of the earth and of the magnet. It is a circle of mysteries; and the desire to enter it—to explore its untrodden wastes and secret chambers, and to study its physical aspects—has grown into a longing."

Marine ice is whittish, opaque, and rough on the surface, and consists of thin flakes of a porous spongy texture. From the quantity of strong brine enclosed in its substance, it is very heavy and dense, and projects only one-fifth above water. When sea-water begins to freeze, it partially deposits its salt, which, thus set free, retards the process of congelation below. Old floes are almost fresh, but a thaw renders them brackish. The polar seas do not congeal until the temperature falls to 28½ degrees of Fahrenheit, which takes place in September in the north, and March in the south; though even in summer, a slight increase of cold is sufficient to form young ice several inches thick. The sun sets early in November, and the severity of the arctic winter begins in December, continuing to the end of January, during which time the thermometer ranges to about 40 degrees below zero. A week or two of milder weather comes on; but the middle of February brings with it the sun, immediately followed by the most intense cold of the whole winter. After that, the sun's influence begins to be felt, and in July the ice breaks up. During the three summer months, the sun never sets, but noon and midnight are equally illumed by brilliant sunshine. A few stars appear in September. The darkest part of the winter is from the middle of December to the middle of January, when the aurora transforms the sky into a vault of fire, and paraselenæ appear, surrounding the moon with blazing crosses, circles, and mock-moons, scarcely surpassed by the wonderful deceptions of the solar rays. The intense cold of February is accompanied by considerable twilight; and in the latitude of Banks' Land, there is even at the end of January tolerable light from 9:30 a. m. to 2:30 p. m., so much so, that at noon Arcturus is the sole star unquenched by the increasing daylight. The only navigable time is from July to September within the northern, and January, February, and part of March within the southern circle. During the rest of the year, the arctic regions are impenetrably sealed by vast fields of ice, both "floe" and "pack," covering every foot of water, from the shallowest inlet to the wide expanse of Baffin's Bay or Melville Sound.

The interior of Greenland is occupied by vast glaciers which encroach on the coast, filling the deep dark fiords with frozen snow. As summer advances, those portions of the glacier that project into the sea are undermined by the waves, and fall with tremendous noise, rocking in the foaming water till they gain equilibrium, when, perfect icebergs, they float here and there, impelled by winds and currents. Many are borne by the polar current southward. They meet the warm waters of the Gulf-stream in latitude 50 degrees, where they melt, and deposit the loads of earth and stones borrowed from the Greenland soil. According to Maury, this has probably, in course of time, formed the Grand Bank of Newfoundland. They are in incredible numbers. As many as five hundred have been counted in sight together, ranging from fifty to three hundred feet in hight, and of all sizes up to a mile in extent. Their appearance is very beautiful and no less extraordinary. Gothic churches, Egyptian temples, aerial palaces with pillars and arched windows festooned with crystal draperies, are only some of the inconceivable varieties of form displayed, while

they gleam under the summer sun like mountains of burnished silver, with pinnacles and cliffs of clear sapphire or the palest green, from which rush cataracts of limpid water mingled with fragments of ice. These various hues arise from several causes. Bergs are originally composed of fresh water ice of different ages, but that formed from salt water frequently overlays it in parts. A great deal of snow lies on their summits, and forms large ponds of fresh water, when dissolved by the heat of the sun. Finally, the solar rays touch the bergs with colors, changing with the position of the spectator. Only one-eighth of their total thickness is seen above water. Frequently bergs capsize in consequence of the sea undermining their base. An ominous rolling motion gives notice of this event; it continues for some time, and at last the berg heels over and disappears with a terrific plunge, sending up columns of spray. It reappears bottom upwards, balances itself, and floats quietly on with a changed face.

All the antartic land yet discovered consists of gigantic cliff without a single opening, three thousand feet high in some places, descending in others to one hundred feet. The whole is faced with ice of enormous thickness, and covered with snow, so that at a glance the eye can scarcely imagine it to be land at all, but for spots showing the dark stones where the cliff is too perpendicular to admit of even ice maintaining its hold. Nothing is so tenacious as the cold of the antartic regions. In February the warmest summer month of 1841, the thermometer never rose above 14 degrees at noon near the continent. It is rarely above 30 degrees in the sun at mid-day during summer, and falls in winter more than 50 degrees below zero. The sun stays a week longer north of the equator than it does south, making the winter and night of the antarctic regions longer. South Georgia, in a latitude corresponding with that of Yorkshire in the northern hemisphere, is always covered with frozen snow, and produces scarcely anything but mosses and lichens. The immense preponderance of water south of latitude 30 degrees, allows the fierce westerly winds to blow round and round the world, a perpetual cyclone, keeping the sea in constant agitation.

The two polar circles differ greatly in physical conditions. The antarctic has a marine climate, that is to say, it is equable. Though wet and stormy, it is not subject to extremes of temperature, and it is believed that the south pole must be warmer than the north in winter. Arctic sunshine raises the thermometer to 66 degrees or 70 degrees, and hung in the shade immediately after, the mercury falls to the freezing point. The arctic climate is continental—dry, calm, and variable. The thermometer has a range of about 120 degrees; and while the round of the seasons brings but little change in the frightful antarctic wastes, nothing can surpass the beauty of the arctic summer—"an endless blaze of light, the air and sea and earth teaming with life," plains glowing with richly tinted flowers, and strange, glittering forms sailing past "in stately and solemn procession." Its currents are strong, and bear large numbers of bergs to meet the warm Gulf-water, and, as it is natural to suppose, bergs are found to be most numerous where the drift is strongest. The antarctic seas are in direct opposition to this. Not only are its currents sluggish and feeble, but the most powerful of them, Humboldt's Current, carries few bergs along the Chilian coast, while the main ice-drift is towards the Falklands on one side, and the Cape of Good Hope on the other, where there is scarcely any motion of the water. This is a fact which no navigators are able to explain, except perhaps on the supposition that there may be strong submarine currents at a great depth below the surface. Bergs have been observed in Baffin's Bay drifting rapidly to the north, where there was a powerful surface-current running against them, showing that in consequence of their weight and immense draft of water (in some instances more than a thousand feet), they must be influenced by some "resistless undertow" yet stronger. —*From Chamber's Journal.*

Nest-Building Fishes.

The *Anabatidæ* form one of the most remarkable of all species of fishes, owing to their capability of living for a long time out of water, a power which has formed in them some curious habits. The *Anabas scandens*, or climbing perch, of India, has been known to live for six days out of its appropriate element; and some will sometimes quit the water and wander over the land, so far from any stream or pond that they were formerly supposed to have dropped from the clouds. The German naturalist Daldorff states that he once saw one of this species which had climbed a tree to a height of five feet but this is stated by other observers to be an impossibility. This power is due to the peculiar structure of the pharyngeal bones, which, in a cavity in the base of the skull, are dilated into voluminous *laminæ*, forming cells in which a supply of water may be carried for the purpose of keeping the gills moist.

But the gourami's instinct is more peculiar than that of any other member of the tribe. By their united labors, the male and female construct a well built nest, in which the ova are deposited, and which protects the young fry from the thousand enemies by whom infantile fish are pursued and tormented.

The body of the gourami is of a brownish color, varied with some golden tints on its sides; the belly is of a silvery brown. The conformation of the fish is high from its belly to back, and the body is narrow; the head is short, the mouth small and protractile. The scales are large and round. The fish is properly herbivorous, but will eat insects and earth worms; and it is so voracious that, says M. Dabry de Thiersant, the creoles of the Mauritius call it the hog of the river.

The gourami, like most other *anabatidæ*, is found throughout the East Indies, and is a valuable food fish of delicious flavor, resembling that of the European carp.

Many attempts have been made by the French to acclimatize it on this continent, especially in Cayenne; but little success has been met with. In Algiers, other attempts have been made, and greater encouragement followed. At the Cape of Good Hope and in Australia, the experiments were entirely successful.—*Scientific American.*

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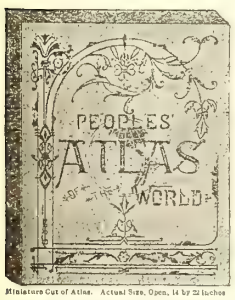

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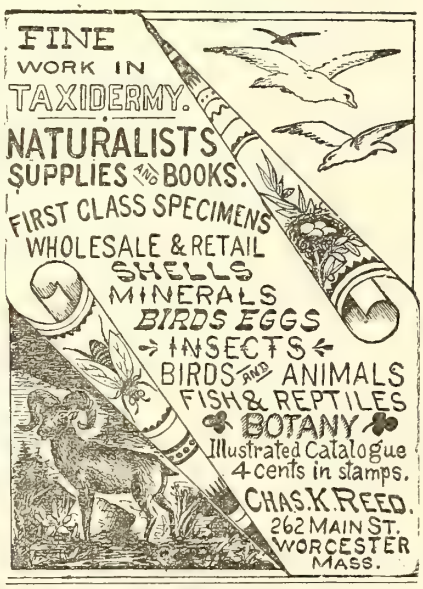

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NATURAL SCIENCE NEWS

VOL. II. No. 5. ALBION, N. Y., FEBRUARY 29, 1896. Whole No. 57.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

TO EXCHANGE.—I have Vol. I NATURAL SCIENCE NEWS, 20 numbers of the L. A. W. Bulletin, five *Museums*, five *Oregon Naturalists*, and some back numbers of the OOLOGIST to exchange for bird and mammal skins, etc. S. P. HARWOOD, 59 W. Mt. Royal Ave., Baltimore, Md.

CLIMBERS.—The "Owl" season is at hand and you want a good pair of climbers that will not break. The "All Steel Climber" will fill the above requirements. Price with straps $1.50; without, 80 cents. Address R. C. ALEXANDER, Plymouth, Mich.

WANTED.—A tame Grey Squirrel that can be handled, will give in exchange an Imported Red Squirrel, or pay cash. R. D. WAINWRIGHT, Eltingville, S. I., N. Y.

A FINE Walnut Cabinet, 20 drawers for coins, &c. Will exchange for sets of 1st class eggs and climbers. R. D. WAINWRIGHT, Eltingville, S. I., N. Y.

BEAUTIFUL LIMESTONE.—Filled with crystalline points, any price over 4c. Guarantee at least twice as large as dealers ordinarily send! Plain limestone, clayey shale, any price. Showy mica schist 3c to 11c. Data with all. OTTO GRADY, Ludlow, Ky.

DAVIE'S "KEY," $1; McIlwraith's "Birds of Ontario," $1.75 (new); 75c egg drill, 40c; one years subscription to the *Museum*, 30c, the OOLOGIST, 40c, NATURAL SCIENCE NEWS, 50c; $5 worth choice sets $1.50; "Dora Thorne," "East Lynne," "Tour of the World in 80 Days," "Don Quoxite," "Ivan the Serf," "Emerson's Essays," "Sam Jones Anecdotes," "Pilgrim's Progress," and "Maid of Orleans" (complete NEW, cloth bound) 15c each; $6 worth choice U. S. and foreign stamps for $2; first quarter '95 *Forum* magazine (new), 4 copies, cost $1, for 50c; new coin and stamp catalogue, egg tools, stamps, and books too numerous to mention at less than half price. Everybody cheerfully answered. EMMET D. AUSTIN, Randolph, O.

NAIL THIS.—To everyone sending 10c within 20 days I will mail the latest novelty out (regular price 25c). 'The Japanese Fun-giver.' Gives more pleasure than a $20.00 cabinet of curios. Address BOX 20, Ivarea, Pa.

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WANTED:—Miners in the West to send me mineral specimen samples. If satisfactory will pay cash or eastern minerals cut or rough gems, shells, coral, etc. Correspondence with collectors and mining men solicited. ROBERT BURNHAM, 15 Chestnut St., Providence, R. I. 56-2t

DEAR SIR:—I am anxious to have you see a collection of the Famous Herkimer County Crystals, hence I make you this offer: If you are a subscriber to this paper, let me send you by return mail, post-paid, 36 of these Brilliant Gems; if they please you send me 72 cents, if not satisfactory return the collection and it will be O K. Yours respectfully, A. B. CRIM, Middleville, Herkimer Co., N. Y.

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Alert investors now have an opportunity to secure some of the stock of this great enterprise. They can buy New York Mercury stock at the very low price of $10 per share. The Mercury Printing Company is incorporated under the laws of the State of New York. The capital is $500,000, divided into 50,000 shares of $10 each, full paid and non-assessable. Stockholders have no [illegible] whatever. This stock is [illegible] profitable [illegible] to pay large dividends [illegible] in value. It gives the [illegible] chances with the [illegible] from one share [illegible] a capitalist [illegible] When one [illegible] that stock in other New York newspapers commands, it is apparent that this present opportunity to buy New York Mercury stock at $10 is one of those chances that occur only once in a lifetime, for at the present rate of increase shown in the past six months in the circulation and in the advertising, the stock is absolutely sure to pay enormous dividends and rapidly rise in value.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum, 1½ inch single valves	1
8.	" serratium, 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch, single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

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50	var. U. S.	$ 50
50	" foreign, including Japan	05
100	" " " Mexico	10
25	" unused	20
8	" Columbians	20
12	" Cuba, unused	20
7	" Ecuador, unused	10
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I also desire second-hand copies of any standard book, reports or publication devoted to Ornithology, Oology, Geology, Mineralogy, Paleaontology, Zoology, Conchology, Botany, Microscopy, etc., etc.

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Hervey's "S a Mosses."

Sargent's "Silva of N. A."

Hough's "Am. Woods."

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Any of Dana's, Winchell's, Miller's and Geikie's Works.

Conchology.

Any of Tryon's, Sowerby's, Gill's or Woodward's Works.

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Any of Packard's or Comstock's Books.

Any of Maynard's, Edward's or Scudder's Works on "Butterflies."

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I can also give a complete stock or outfit for a Fair Exhibit or Summer Resort "lay out," ranging in value anywhere from $10 to $1,000, consisting of shells, curios, specimens, souvenirs, novelties, etc., etc. (I have sold $10,000 worth of these goods during the past ten years

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FRANK H. LATTIN, Editor and Publisher,
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Objects of Interest on a Guano Island.

A recent writer from Baker's Island, in the South Pacific, off the coast of Peru, about 2,500 miles, gives an interesting account of life on that little patch of *terra firma*, which carries upon its bosom nearly a million tuns of guano.

He mentions that fish of remarkable beauty, weighing from fifty to sixty pounds, are abundant, and are easily taken with a hook. Sharks abound also—murderous sharks who swarm about the ship with greedy and persistent devotion. These sharks are, by hereditary proclivity, man-eaters; and the white man who comes within their reach is snapped at in an instant by a score of ravenous mouths. But, strange to say, a dark-skinned Polynesiam will swim about their midst and rarely be molested. I have seen a native of the Hawaiian Island heartlessly jump from the bow of a ship into the midst of a "school" of these fellows, swim, with the end of a line in his mouth, to one of the buoys, and return to the vessel uninjured.

Whether there is a sort of free-masonry between the sharks and the Kanakas, or whether the tastes of the shark are too fastidious, and not sufficiently cannibal to relish cannibal flesh, has not been satisfactorily explained. But the shark and the Kanaka are on the friendliest terms imaginable.

The flying fish abounds in these waters. When pursued by the dolphin, their foe, whole schools of them may frequently be seen to leap out of the water and fly for several hundred yards, skimming along quite near the surface and now and then gaining new velocity by striking the crest of a wave with their long, ray-like, pectoral fins. But this beautiful fish has enemies in the air as well as in the sea, and frequently its aerial flight is cut short by some fleet sea bird that is ever on the alert to seize its prey.

THE FEATHERED INHABITANTS.

Among the chief objects of interest on the Island to a visitor are the birds; and they are well worthy of study. The sea-fowl are at all times a noisy set, but at night, while the older ones are engaged in the quarrels of love-making, and the young are complaining over their scanty rations, the Babel of their chattering is destructive to the sleep of one unused to such disturbances.

During the first night of my stay on this forlorn spot, it seemed at times as if the house were beseiged by innumerable tom-cats; then the tumult resembled the suppressed bleating of goats, and I heard noises as of bats grinding their teeth in rage; again it was the querulous cooing of doves, and soon the chorus was strengthened by unearthly screams, as of ghouls and demons in mortal agony. But on going forth into the darkness to learn the cause of this infernal serenade, all was apparently calm and serene, and the radiant constellation of the Southern Cross, with the neighboring clouds of Magellan, looked me peacefully in the face, while, from another quarter of the heavens, the Pleiads shed their "sweet influences" over the scene.

The most quiet time of night with the birds is about day-break, when they seem to subside into "cat-naps," preparatory to the labors of the day.

By day many of the birds range on tireless wing, over leagues of ocean, in quest of fish. But still the number of them that remain about the island is so great as to defy computation, and as you pass through their haunts, in some places they rise in such clouds actually to darken the air above you.

The eggs of some of the birds are of fine quality, and are much esteemed by the Americans as well as the Hawaiians on the island. Those of a bird called the *nu-e-ko* are most valued. This name is an imitative word, derived from the cry of this restless creature, and is applied to it by the Hawaiians, who have quick intuitions in onomatopoetic matters.

The *nu-e-ko* is a bird of moderate size bearing a striking resemblance to the piping plover, It is less phlegmatic and stupid than most of the other birds, and does not waste so much of its time in droning and crooning and love-making.

Yet it is not undomestic in its habits. While the father is engaged in the business of the island, providing for the wants of the family by fishing, the mother is ever hovering near her half-fledged young, now inviting them to try their wings in flight, and now hustling them out of sight under some clump of brown grass, and teaching them to lie close in order to escape observation.

The *nu-e-ko* does not make its home on the guano fields, but prefers the sandy shingle nearer to the ocean. The plumage of its back is brown, spotted with gray, a color, so nearly resembling that of the sand upon which it makes its nest, that it might almost escape detection. But, when danger approaches it rises on the wing, uttering its shrill, peculiar cry of "*nu-e-ko! nu-e-ko!*" and leaves its egg or its young to the tender mercy of the intruder. As it spurns the ground it shows its throat, breast and wings, lined with showy feathers, that glint in the sun like flakes of silver, while it whirls and curvets in the air. This bird is plain in its tastes, and for a nest is content with a simple hollow, scooped out of the sand, the warmth of which assists in the incubation of its speckled eggs.

The Gannet (*Sula bassana*) is a bird of great power and beauty. The color of the grown bird is white with wings that are tipped with black It has a long sharp beak which is serrated and slightly curved at the end, a formidable weapon of attack as of defense. Its wings are of immense strength, and when fully spread, they span about seven feet from tip to tip. In their fishing expeditions they range for hundreds of miles from their nesting places, and late in the day ships in mid-ocean often see

long files of them returning home like heavy laden treasure vessels speeding to port. This sight is regarded by seamen as a sure indication that land lies in the direction of their flight, though it may be scores of leagues away.

In regard to moral character, the birds may be divided into two classes—those which make an honest living and those which are robbers. The Gannet stands at the head of the respectable birds, and is a thrifty and honest citizen of the air.

The representative of the thievish class is the frigate-pelican or Man-of-war Hawk(*Tachypetes aquilus*). This bird has a dense plumage of gloomy black, a light wiry body, that seems made for fleetness, and wings of even greater spread than the Gannet's. Its tail is deeply forked, its bill is long, sharp, and viciously hooked. Audubon records the frigate-bird as superior perhaps, in power of flight, to any other. It never dives into the ocean after fish, but will sometimes catch them while they are leaping out of the water to escape pursuit. It is often content to glut itself on the dead fish that float on the water, but it depends mostly, for a subsistence upon robbing other birds. It is interesting to watch them thus occupied.

As evening comes on these pirates may be seen lying in wait about the island, for the return of the heavily laden fishing-birds. The smaller ones they easily overtake and compel them to disgorge their spoils; but to waylay and levy blackmail upon those powerful galleons, the Gannets, is an achievement requiring strategy and address. As the richly laden Gannet approaches the coast of his island home, he lifts himself to a great height, and steadily oars himself along with his mighty pinions, until he sees his native sands extending in dazzling whiteness below. Now sloping downward in his flight, he descends with incredible velocity. In a moment he will be with his affectionate mate who is awaiting his return to the nest.

But all this time he is watched by the keen eye of the Man-of-war Hawk, who has stationed himself so as to intercept the Gannet in his swift course.

With the quickness of thought the Hawk darts upon him, and, not daring to attack boldly in front he plucks him by the tail, and threatens to upset him, or he seizes him at the back of his neck and lashes him with his long wings. When the poor Gannet, who cannot manœuvre so quickly as his opponent, finds himself pursued, he tries to buy his ransom by surrendering a portion of his fish cargo, which the Hawk, swooping down, catches, before it has had time to reach the earth. If there is but one Hawk this may be a sufficient toll, but if the unweildy Gannet is set upon by a number of these pirates, he utters a cry of real terror and woe, and, rushing through the air with a sound like a rocket in his rapid descent, he seeks to alight on the nearest point of land, well knowing that when once he has a footing on *terra firma* not even the Man-of-war Hawk dare come near him.

The Man-of-war Hawk is provided about its neck and chest with a dilatable sack, of a blood-red color, which it seems to be able to inflate at pleasure. On calm days, about noon, when the trade-wind lulls, giving place to a sea-breeze that gently fans the torrid island, these light, feathery birds may sometimes be seen at an immense height balancing themselves for whole hours without apparent motion on their out-stretched vans.

Whether they are able to increase their specific levity by inflating their pouches with a gas lighter than the atmosphere, or whether they are sustained by the uprising column of heated air that comes in on all sides from the ocean, is a question I am unable to answer. While floating thus, this bird has its pouch puffed out about its neck, giving it the appearance as though it had its throat muffled in red flannel.

The most unique and novel bird on the island is the Tropic-bird or marine-spike (*Phæthon phœnicurus*).

Its wings are long and its flight very rapid. It is distinguished by two slender, tapering feathers, of rare beauty, which project like a long steering oar from its wedge-shaped tail.

I cannot resist the temptation of alluding to one other bird that abounds here. It is the Mother Carey's chicken (*Thalassidroma Wilsonii*)—an ocean butterfly—the pet and favorite of every true sailor. This bird is about the size of a chimney swallow. Its pretty ways and seemingly innocent affections, are enough to win the heart of almost anyone. The society and study of these birds are not without an inspiration.—*From an old Scientific American.*

Age of Trees and Size of Timber.

W. W. Spicer contributes in an old issue of *Hardwicke's Scienc Gossip* an interesting article on the above subject. He says:

"The life of a plant is determined by its inner structure, by the laws of its growth, by its power of resisting external injuries, and by other circumstances, many of which are a mystery, and no doubt will remain so. But, bounded though it is within limits as narrow and those which hedge round the life of man or the lower animals, there are cases on record of certain members of the vegetable kingdom whose existence has been prolonged for very extraordinary periods.

"The most celebrated of all old trees (and perhaps the most curious which does not generally boast of long-lived members) is the Great Dragon tree, of Orotova, in Teneriffe. This monstrous specimen, which came to an untimely end in a hurricane a few months ago, was well known and carefully looked after at the conquest of the island by De Bethencourt in the year 1402. It appears to have been of the same size and appearance then as now—namely, from 70 to 80 feet, with a hollow trunk of about 20 feet in diameter—whence, judging from the slowness of growth in this family of plants, and the little change that has taken place in four centuries and a half, it is inferred that the tree could not have been less than 5,000 years old at the time of its death. Another giant among the pigmies of modern days is the Bao bab (Adansonia), an African tree, specimens of which, growing on the banks of the Senegal river, 60 to 80 feet high in diameter, were estimated by Adanson to be over 5,000 years old. The Portuguese, on their voyages of discovery, were in the habit of carving their names, etc., on conspicuous trees, as a memorial of their having been the first to visit the spot. Adanson arrived at the age of the trees by comparing the depth of the indentations with the number of 'rings' in the portion of wood overgrowing them. The names themselves bore a date which showed them to have been cut three centuries prior to his visit. It has been suggested that possibly in a tropical climate these rings may not be so good a test of age as in our more temperate clime, where they are really

annual. Nevertheless allowing that the Baobab forms two rings in each year, in lieu of one, it is still deserving of 'honorable mention.' Yews have a great reputation as long-livers. The care usually taken of them in church-yards and similar places, no doubt tends greatly to their preservation. Thus a yew in the church-yard of Brabourne, in Kent, has, it is believed, reached the enormous age of 3,000 years; another at Fortingal, in Scotland, is quoted at 2,600 years, and others at Crowhurst, in Surrey and at fountains Abbey, are put down at 1,400 years. The yew has some near relatives in the cypress, the Taxodium, and the Wellingtonia. Of the first there is a specimen at Grenda, which was a celebrated tree before the Moors were expelled from Spain by Ferdinand and Isabella, toward the end of the fifteenth century. A *Taxodium distichum* at Oaxaca, in Mexico, which in 1829 measured 120 feet in height by 117 in circumference, is supposed to number forty centuries. It sheltered Hernan Cortez and his little band of adventures under its wide-spreading boughs about the year 1520. Among the gigantic Wellingtonias (orWashingtonias, as our thin-skinned cousins across the Atlantic will persist in calling them in spite of priority of title)—among these mammoth trees of California, which reach a height of 300 or 400 feet, individuals have been observed which must have witnessed 3,000 summers.

"Two other American trees, both Brazilian, have been noticed for their size and probably long lease of life. The first is the Bertholetia, which supplies the 'Brazil nut' of commerce, specimens of which, growing on the banks of the Amazon, have been noticed with more than 1,000 distinct rings. The other is the Hymenæa, in connection with which I transcribe the following passage from 'Lindley's Vegetable Kingdom.' The size of the timber is sometimes prodigious. The locust trees of the west have long been celebrated for their gigantic stature, and other species are the colossi of South American forest. Martius represents a scene in Brazil, where some trees of this kind occured of such enormous dimensions that fifteen Indians with outstretched arms could only just embrace one of them. At the bottom they were 84 feet in circumference, and 50 feet where the holes became cylindrical. By counting the concentric rings of such parts as were accessible, he arrived at the conclusion that they were of the age of Homer, and 332 years old in the days Pythagoras; one estimate indeed reduced their antiquity to 2,052 years while another carried it up to 4,104; from which he argues that the trees cannot but date far beyond the time of our Saviour.

"My remaining examples are European. Among them is a chestnut tree growing on Mount Etna, and generally known as *Castagna di cento cavalli*, on account of the immense space which it overshadows. It is 180 feet in circumference, and cannot be less than one thousand old. A scarcely less celebrated tree is growing at Tortworth, in Gloucestershire. It was a tree 'of mark' in the days of King John. The great lime tree of Neustadt on the Kocher, in Wurtemburg, which as early as 1220 caused the town to be known as *Neustadt ander grossen Linde*, is believed to be not less than 800 years old. Its stem is 38 feet in circumference. At Worms, where there has been lately such a gathering of crowned and ducal heads to do honor to the memory of the geat Reformer Luther, is an elm well known in Germany as the Lutherbaum, which measures 116 feet in height, with a stem 35 feet in circumference, and has attained an age of not less than 700 years.

"A less venerable member of the vegetable kingdom, though still one that can look back through a tolerable vista of years, is a Judas tree (*Cercis siliquastrum*), in the Botanic Garden at Montpelier; it was planted in 1598, and consequently numbers 260 years. Its trunk a short time ago measured 12 feet around In 'Science Gossip' of last year, p. 163, was given a short account of a rose, which covers one end of the principal church at Hildesheim, in Hanover. This remarkable climber was well known as 'a monument of the past' as early as 1054. Tradition assigns its origin to the year 814, under Louis the Pious, son and successor of Charlemagne.

"Another tree with a legendary history is a 'Gospel Oak' in my own neighborhood in Hampshire, standing in Avington Park. If we are to believe the stories told of it, and common there in every one's mouth, this 'old, old tree' was spared, at the earnest intercession of certain monk residing at Winchester, solely on account of its great age, when a brother of William the Conqueor leveled the surrounding forest of Hampage, about A. D. 1076. For some sixteen centuries, therefore, it has defied the storms of winter; but the latter have conquered at last. Ten years ago the old veteran made a final struggle to show some signs of life; and now it stands a hollow trunk, with two or three bare and withered arms, and only prevented from falling by a stout band of iron, with which it is encircled. A mere infant by the side of the Avington tree is the Great Oak of Pleischwitz, near Breslau, whose age is reckoned by Goppert at 700 years. It was blown down in 1857; its fall being due to a hollow within its huge stem, which could accommodate with ease twenty-five or thirty persons standing upright.

"Dr. A. B. Reichenbach, in his "Vollstandige Naturgeschichte," says: 'We know of lime in Lithuania with 815 annual rings, and a circumference of 82 feet; of oaks in the Polish forest in which one can count 710 perfect rings, and whose stems measured 49 feet round. There are elms whose age is known to be above 350 years, ivy 440, maples 516, larch 570, oranges 640, planes 720, cedars 800, walnut 900, limes 1,000, pines 1,200, oaks 1,400, olives 2,000.' From these numerous examples of extreme old age one may almost conclude that (provided the seed from which they spring be sound, the soil and climate favorable, and the means of nourishment abundant) the existence of many plants may be extended to an indefinite period, should they be fortunate enough to escape accidents from without."

Leeches.

This animal has had a reputation from the earliest periods of medical science. Even from the time of Homer, the appelation of leech was given to the practitioners of the art of surgery, and in many of the languages of German derivation the word signifying a physician is identical with that given to the leech. From an old English exchange we gather the following facts relative to the life and habits of this species of aquatic worm, which is indeed among the lowest classes of the animal chain of being:

"There are about thirteen or fourteen species of the leech, some of which are found in most parts of the world; but the medicinal species is best known, and abounds

in various parts of the world—as America, Russia, Hungary, Spain, Portugal, in the marshy plains of Egypt, and in various parts of Asia. It belong to the class *œnnelides*, or ringed worms, its body being composed of a series of rings, or circular muscles, by the successive contraction of which it moves along either in the water or upon the surface of leaves, reeds, or other solid bodies. The tail extremity is in the form of a cup or sucker, by which it adheres firmly to flat substances, on the same principle as a boy's leather sucker adheres to and lifts up a stone. The mouth is also in the form of a sucker, and is, moreover, furnished with three cartillaginous teeth, placed so as to form with each other a triangle. When examined and felt with the point of a finger, they seem soft and blunt; but the animal, when about to pierce the skin, seems to have the power of erecting them into firm, sharp-edged lancets, which saw through the integuments in a single instant, and almost without inflicting any pain. Having made the puncture, the blood is extracted by a process of suction, and is passed through the œophagus into the stomach, or rather stomachs, of the animal, which consist of a series of communicating cells, that occupy the greater part of the interior of its body. The leech having thus gorged itself to the utmost, if undisturbed, remains in a half-torpid condition till it has digested its gory meal, and not unfrequently dies of the surfeit. If it survives it will be greatly increased in size. They can live for months and years on what appears to be pure water alone. This forms the singular circumstance in the diet of these animals. They delight to gorge themselves with a full meal of blood, even to surfeit; and yet with plain water they live, grow, and seem to have the greatest enjoyment of existence. It would appear as if their three lance-formed teeth, and their carniverous appetites, were bestowed more for the benefit of man than for themselves, and that, in their system of dietetics water is the rule and blood the exception.

The medicinal leech is a native of many parts of Britain, but is now becoming very rare. France is supplied chiefly from Strasburg, whence they are imported from Hungary, Turkey, Wallachia and Russia, and kept in ponds. They are carried into France on spring wagons, and are contained in moistened bags, each bag containing 120 leeches. Previous to 1834 upwards of 46,000,000 of leeches were imported into France annually. At present the numbers have decreased to 17,000,000. They are imported into London and Leith by sea, packed in little bags, which are occasionally moistened with water during the short voyage. In general they arrive fresh and healthy; but they are not unfrequently liable to disease, which destroys great numbers. There are three sorts, or sizes, the largest and middle sorts being reckoned the best. A large leech is calculated to abstract half an ounce of blood, besides the quantity which flows from the wound afterward. The smaller sizes are comparatively inefficacious.

A common animal in the pools of this country is the horse leech. It nearly resembles the other, but is of a more uniform color, and not so decidedly marked with greenish streaks on the backs as the medicinal species. The horse leech has no great inclination to fasten on the human skin, but when it does so it takes its fill, just like the other, and no more, There is a popular but unfounded belief that if a leech of this description do fasten on the skin, it will continue to suck and discharge the blood till every drop in the body is exhausted. Hence they are the dread of every school boy who happens to wade with naked legs into their dominions.

The leech, like many other animals, appears to have a very nice sensibility in regard to atmospheric changes, and especially what regards the electric modifications of the air. Before storms, or any sudden change in the atmosphere, the leech is seen in great activity, and darting up to the surface of the water in its jar. These animals, too, at certain times, are found to move out of the water, and remain for a considerable period clustered on the dry upper surface of the jar; while on other occasions they will remain for days immersed in the water near the bottom. They produce small eggs, which form into cocoons, from which in due time the living young make their appearance.

Geology and the "King Crab."

"Visitors to the Aquarium House at the Zoological Gardens have no doubt noticed the living specimens of that curious creature, the "king crab," which are now in a tank alive and well. The most curious part of their structure is the eyes; they have four, which are composed of numerous lenses, like the dragon-fly or bee, and are so arranged that they can see objects on each side of them. Besides being interesting simply as living creatures, king crabs are the nearest existing relations to the ancient form of beasts called 'trilobites.'" —*The London Field.*

The king crab is what is commonly known here as the "horse-shoe." Such creatures are taken by thousands annually on the marshy coasts of New Jersey and Long Island, and are used extensively for manuring the land. No living specimens are now found in England, but their fossils are uot uncommon. The past geologic age of Europe is similar in many of its features to the present in the New England States. Hugh Miller in his lecture on geology says: "America though emphatically the *New* World in relation to its discovery by civilized man, is at least in these regions an *old* world in relation to geological type; and it is the so-called *Old* World that is in reality the *new* one."

Professor Agassiz says:

"If we compare a list of the fossil trees and shrubs from the tertiary beds of Œningen with a catalogue of the trees and shrubs of Europe and North America it will be seen that the differences scarcely go beyond those shown by the different floras of those continents under the same latitudes. But what is quite extraordinary and unexpected is the fact that the European fossil plants of that locality more closely resemble the trees and shrubs which grow at present in the Eastern parts of North America than those of any other part of the world. The present Eastern American flora and fauna have a more ancient character than those of Europe. The plants, especially the trees and shrubs growing in our days in the United States, are as it were, old-fashioned."

On this topic Hugh Miller again says:

"Towards the close of the miocene period old Scotland exhibited features greatly resembling those presented to the Puritan fathers by the forest-covered shores of New England, little more than two centuries ago.—*Scientific American.*

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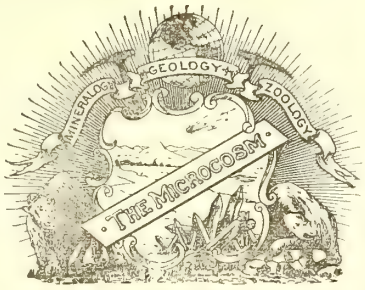

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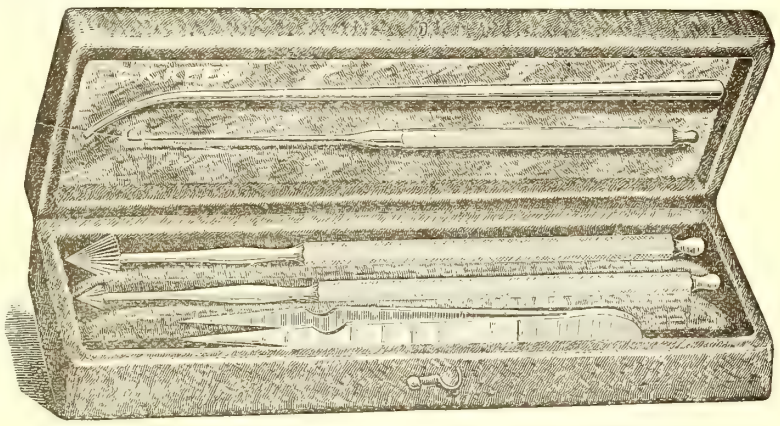

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Owing to the termination of the lease on our present store (in which there are over fifty rooms filled with Minerals and Books) and the necessity of reducing our immense stock before removing to a smaller building in the central part of the city, we have decided to offer the following liberal discounts during the month of March:

15 per cent. on all Cash purchases of Minerals or Books under $50.

20 " on purchases of $50 and upwards.

25 " on purchases of $100 and upwards.

33 1-3 per cent on purchases of $300 and upwards.

Our Stock of Minerals has long been known as the largest, most varied, and valuable in the world, and now, more than ever before, is it replete in thousands of rare and beautiful specimens. With recent wholesale reductions on much of our stock this offer of heavy discounts presents an opportunity that no collector can afford to let pass.

Complete catalogue of collections, together with descriptive list of additions to stock, recent discoveries, etc., sent FREE on application.

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NEW AND SECOND-HAND SCIENTIFIC BOOKS

is unmatched in any store in America. The prices are uniformly low. The condition of any book we sell is always as represented—otherwise you return the book and we refund the money.

LISTS OF BOOKS referring to *Special Subjects* will be furnished gratis on application. In these the descriptions and prices are given. Please mention subject in which you are interested. They include Geology, Mineralogy, Chemistry, Agriculture, Horticulture, Botany, Microscopy, Astronomy, Conchology, Entomology, Ornithology, Ethnology, Zoology, Education, and ALL MEDICAL SUBJECTS.

No discounts will be allowed on orders received later than the 31st of March.

DR. A. E. FOOTE, WARREN M. FOOTE, MGR

1224-26-28 North Forty-first Street, PHILADELPHIA, PA.

NATURAL SCIENCE NEWS

VOL. II. No. 6. ALBION, N. Y., MARCH 7, 1896. Whole No. 58.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

WILL EXCHANGE

Good Foreign Stamps at 50 per cent discount from Scott's latest catalogue and U. S. at 25 per cent. for Shells and Minerals. Send list of what you have and what you want.

LOUIS H. PALMER & BRO.,
58-2t Oak Park, Ills.

WANTED.—Live cocoons of any kind especially of the moths and larger papilio—exchanged. ALEX. H. NOEL, Laclede School, St. Louis, Mo.

STAMPS! 1000 well mixed 35c, 25 well assorted 5c, address. EDWIN G. COREY, 20 East 129 St, New York City.

FOR EXCHANGE.—Camera, old books and a large quantity of large U. S. cents, for Catholic or anti-Catholic books. H. H. HURST, Aurora, Oregon.

WANTED.—"Michigan Geological Survey," five volumes with all maps, can exchange No. 1 skins Upper Peninsula birds or other desiderata. OSCAR B. WARREN, Palmer, Marquette Co., Mich. O.

WHITE OTTER in the flesh, a first class specimen, perfect Albino, what am I offered cash for it? Write soon. JOHN CLAYTON, Lincoln, Maine.

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EXCHANGE.—Single A. O. U., 51a, 53, 54, 212, 331, 333, 273, 316, 334, 443, 506, 511, 542a, etc., for sets with data. J. H. CLARK, Paterson, N. J.

WANTED.—Batty's Taxidermy. Will give books and papers on Natural History. Please write, 6651 Stewart Ave., Englewood, Ills.

POSTAGE STAMPS bought and sold. Good U. S. and Departments 25 per cent. discount; Foreign 40, 50, and 60 per cent. discount according to quality. Cash with order or satisfactory reference. LOUIS H. PALMER & BRO., Oak Park, Ills. 58-4t

WANTED.—Catholic or Anti-Catholic Books. Will give in exchange, Camera, Smith & Wesson Hammerless Revolver, Old Coins, Books or cash. All letters answered, H. H. HURST, Box 13, Aurora, Oregon.

FOR SALE or EXCHANGE.—Engraved gold watch, Am. Waltham works, stem wind and set, nearly new, hunting case, good timepiece, cost $22; with good gold chain. Will sell both for $18 cash; or will take in exchange Coues' Key to N. A. Birds in good condition, and climbing irons, rest cash. GUY K. BARNES, Strawberry Point, Iowa.

WANTED.—Everyone to send 10c for photo of our self locking cabinets. See ad. elsewhere. HANAFORD CABINET CO., 139 and 141 W. Fulton St., Grand Rapids, Mich. 58-2tO

A CAMERA FOR EXCHANGE.—I will exchange a nearly new Kombi camera, loaded for 25 exposures, for the best offers of first class sets of eggs with data. O. W. KNIGHT, 384 Hammond St., Bangor, Maine,

COLLECTION of Coins and medals for sale, or will trade for animal skulls or other specimens. W. HARVEY McNAIRN, 4 Harvard Ave., Toronto, Ont.

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DEAR SIR:—I am anxious to have you see a collection of the Famous Herkimer County Crystals, hence I make you this offer: If you are a subscriber to this paper, let me send you by return mail, post-paid, 36 of these Brilliant Gems; if they please you send me 72 cents, if not satisfactory return the collection and it will be O K. Yours respectfully, A. B. CRIM, Middleville, Herkimer Co., N. Y.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. tf

"PLAIN HOME TALK and Medical Common Sense," Foote. A Standard Family Medical Book, nearly 1000 pages, new, cost $3.25. Will exchange for desirable sets or specimens. What offers? FRANK H. LATTIN, Albion, N. Y.

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds.," EDWIN E. HOWELL, 612. 17th St. N.W., Washington, D.C.

FOR SALE or EXCHANGE.—Collecting gun, camera, typewriter, stamp album and stamps, three volumes of People's Cyclopedia (cost $20) U. S. sabre used in Revolutionary, minerals, mounted birds, deer heads, fox skin mat, sets and skins for best offer in sets, skins, books on Ornithology and Natural History specimens. Will sell cheap for cash. GILMAN T. BROWN, Taxidermist, North Turner, Maine. O

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, 15 Chestnut St., Providence, R. I. 51-25t

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will 'swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

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MEEKER & LUCAS
Successors to
MEEKER-TOWE STAMP CO.
Dealers in Foreign and U. S. Postage Stamps.

BRIDGEPORT, CONN., FEB 17, '96.

MR. FRANK H. LATTIN:

We hereby agree to use 1000 lines in the NATURAL SCIENCE NEWS at 2½c per line; same to be used within one year from date.

MEEKER & LUCAS.

Enclosed please find contract for advertising in NATURAL SCIENCE NEWS; also copy for a 20 line ad. in next issue of the NATURAL SCIENCE NEWS.

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OF OVER

A MILLION DOLLARS

A YEAR EACH.

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Alert investors now have an opportunity to secure some of the stock of this great enterprise. They can buy New York Mercury stock at the very low price of $10 per share. The Mercury Printing Company is incorporated under the laws of the State of New York. The capital is $500,000, divided into 50,000 shares of $10 each, full paid and non-assessable. Stockholders have no individual liability whatever. This stock is a safe, solid and highly profitable security that is certain to pay large dividends and rapidly increase in value. It gives the small investor an equal chance with the capitalist, as any person with a small sum to invest can buy from one share upward at the same price a capitalist buys his shares. When one considers the very high prices that stock in other New York newspapers commands, it is apparent that this present opportunity to buy New York Mercury stock at $10 is one of those chances that occur only once in a lifetime, for at the present rate of increase shown in the past six months in the circulation and in the advertising, the stock is absolutely sure to pay enormous dividends and rapidly rise in value.

The advertising receipts of the Mercury have doubled since Aug. 1, 1895, and the circulation has increased at the rate of 150 per cent. since April 1, 1895, on the Daily, Weekly and Sunday editions, and is continuing to increase at the same rate.

We will send one copy of the Daily and Sunday Mercury free to every shareholder as long as the stock is held by him or his assigns. For example, if a subscriber purchases ten shares of stock he will be entitled to ten copies of the Daily and Sunday Mercury free to his own or any other address as long as he continues to be a stockholder of the corporation. These copies of the paper may be disposed of by subscribers to the capital stock in any way desired by them.

There will be only a limited amount of this stock disposed of in this way. Those who are lucky enough to obtain these shares will find that in a very short time they will be worth 300 per cent. premium.

For further particulars address the SUPERINTENDENT OF CIRCULATION, NEW YORK MERCURY, 3 Park Row, New York.

As an advertising medium the New York Mercury is unexcelled.

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

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2.	Fulgur perversus, 3 to 8 inch	6
3.	Fasciolaria tulipa, 2 to 6 inch	8
4.	" distans, 1 to 3 inches	4
5.	" filamentosa, 1 to 3 inch	2
6.	Cardium magnum, 3½ to 4 inches	6
7.	" muricatum. 1½ inch single valves	1
8.	" serratium. 1 to 2½ inch	3
9.	Arca ponderosa, 2 to 3 inch	3
10.	" noæ 1 to 4 inch	3
11.	" floridanum, 2 to 2½ inch	3
12.	Cytherea (callista) gigantea, 3 to 5 inch	10
13.	" " maculata, 1 to 2½ inch	6
14	Natica duplicata, 1 to 3 inch	2
15	Chama Arcinella, 1 to 2 inch	5
16	Dosinia discus, 2 to 4 inch	5
17	Pholas costatus, 3 to 6 inch, double valve	15
18	Murex pomum, 1 to 3 inch	3
19	" salleanus, 1 to 3 inch	5
20	Pyrula papyratia, 3 to 5 inch	8
21	Pecten exasperatus, ½ to 3 inch, single	1
22	Conus Floridanus, ¾ to 1 inch	2
23	" proteus, 1 to 3 inch	10
24	Pinna muricata, 4 to 10 inch	8
25	Lucina edentula, 1½ to 3 inch, single	2
26	Cancellaria carolinensis, 1 to 1½ inch	3
27	Oliva litterata, 1 to 2½	2
28	Anomia ephippium, 1 to 2½ inch	1
29	Melongena subcoronata, 2 to 6 inch	8
30	Cerithium eburnum, 1 to 1½ inch	3
31	Turritella, 1 to 1½ inch	2
32	Tellina, ½ inch	1
33	Marginella, ¼ inch	2
34	Large liver sea bean, 3c; black banded sea bean, 2c; grey sea beans	1
35	Sea beaver	15
36	Conch spawn ribbon 18 inch to 2 feet	20
37	Skate eggs	5
38	Rose coral, shaped like a rose	10
39	Florida air plants	10
40	Tarpon scales	2
		$2 15

Retail price for the above 40 specimens is $2.15 by our price list. We will send any one of the above numbered specimens upon receipt of price quoted, or the entire collection, 40 specimens, upon reciept of only $1.50. We gather our own shells and gather only first class shells. By comparison our prices will be found a half lower than other dealers, because we are right on the coast and are put to no extra expense. Give me an order and you will be convinced. Send stamp for price list.

J. C. Baker successor to **Baker & Hanson**

Myers, Lee Co., Florida.

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To close out we have put our approval sheet stamps into packets cataloguing $1.00 and over, no two alike, 25c: $2.00 worth, no two alike, 50c.

50 var. U. S.		$ 50
50 "	foreign, including Japan	05
100 "	" " Mexico	10
25 "	unused	20
8 "	Columbians	20
12 "	Cuba, unused	20
7 "	Ecuador, unused	10
6 "	Costa Rica, unused	15

1000 varieties stamps only $6,50 net. This packet contains no locals, telegraph cards, reprints or U. S. stamps. Every stamp in good condition.

MEEKER-TOWE STAMP CO.,
Box 296, Bridgeport, Conn.

Cabinets, Cases, Perches, etc.

We have made a specialty of a style of cabinet which we are sure will meet the requirements of the average collector. By doing this we can offer you a much finer cabinet for the money than if made in a variety of styles but if you want something different we can make you one to order of any style or wood. The style referred to is 46 inches high, top 18x27 in., strongly built, mounted on castors, drawers closely fitted to exclude dust, economical in space, elegant in appearance, 11 dovetailed drawers with an arrangement so that all are locked with one turn of the key which is in the center of top drawer, does not show from outside or interfere in the least inside Carved top back, brass pulls, panelled ends. Send 10 cents for photo. Mr. Hanaford of this firm has had over 11 years' experience in fine cabinet work and has held responsible positions in Grand Rapids. All the work being done under his personal supervision. Prices:—Imitation walnut, mahogany, cherry, ebony, oak or clear white pine, finished in natural wood, $8 50; oak antique color, plain, $9 50; quartered, $10.50; walnut or cherry, $10.50; figured birch, $14.00; mahogany or bird's-eye maple, $15.00. The last three are mostly vencered, all oil rubbed, polish finish, from the cheapest to the best.

We also make a style of case which can be taken apart for shipment, for stuffed birds, etc., glass on front and ends; a case requiring a 26x36 front glass, $2 50; extra inch off or on, in width, 3c; height, 1c; heavy oak mouldings, polish finish, shipped without back panel or glass.

Turned T perches made of oak or ash, antique or natural finish, size, 2x1¾, 7c; 3x2½, 8c; 3½x3, 10c; 4¾x4½, 15c; 6½x6, 20c, 8x7, 25c; 10x8, 30c. Samples of first three sizes by mail, 8, 10 and 15c.

Turned stands same as bottoms for above, 3 in , 5c; 4 in , 8c; 5 in., 11c; 6 in., 13c; 7 in., 15c; 8 in., 18c.

Shields for deer heads, large, $1.00; medium, 85c; small, 75c. For horns of deer 50c; steer 75c, elk 85c.

Shields as panels for dead game, 50c, 75c and $1 00, oak, antique or natural color, polish finish —Walnut made to order.

TERMS:—Cash must accompany order unless satisfactory reference can be furnished. We refer, by permission, to Mr. Frank H. Lattin for whom we have done over $75 00 worth of work. Cabinets will be sent freight *prepaid* on receipt of price and if not satisfactory may be returned and money will be refunded, less the cost of freight. Other goods sent at purchaser's expense unless ordered and sent with a cabinet, in which case they will be sent freight prepaid.

Address

HANAFORD CABINET CO.,

139 & 141 W. Fulton St.,

GRAND RAPIDS, MICH.

"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb , 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete*, *clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

CABINETS Send 10cts for photo of our speciality Self locking T perches. Oak samples by mail 8c, 10c and 15c; also stands, shields, glass cases, game panel &c. Cabinets to order. HANAFORD CABINET CO., 139 and 141 W. Fulton St., Grand Rapids, Mich. 58 M O tf

An I vestment in "Natural Science News" Returns Fifty-fold.

BANGOR, ME., FEB. 16, 1896.

FRIEND LATTIN:

I enclose herewith $1.00 for my renewal to NATURAL SCIENCE NEWS. I have found the investment of $1.00 made a year ago for the paper to have returned to me 50 fold. In addition to the excellent articles which have appeared in its columns I have derived fully $20 cash by the sale of specimens to parties whose names have appeared in your exchange columns. I have also through the same means added fully $ 00 worth of specimens to my private collection. Have done this by writing parties who had notices in the exchange columns. O. W. KNIGHT.

RESURRECTION PLANTS:—Have just received a new stock of this wonderful plant. all A No. 1, the regular 25c grade; but while they last will sell at 15c each; 2 for 2 c; 5 for 50c; 12 for $1.00; 100 for $5.00. *Prepaid* at these prices. FRANK H. LATTIN, Albion, N. Y.

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Natural Science News.

VOL. II. No. 6. ALBION, N. Y., MARCH 7, 1896. Weekly, $1.00 a Year

Natural Science News.

A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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A Naturalist's Home.

There is no place like England for a rich man to live in exactly as he pleases. It is the appropriate exercising ground for the hobbies of all mankind. You may join an Agapemone, or you may live alone in dirt and squalor, and call yourself a hermit. The whim of the late Charles Waterton; naturalist, was a very innocent one, namely, to make his home a city of refuge for all persecuted birds, a sanctuary inviolate from net and snare and gun; and he effected his humane purpose. An intimate associate and fervent admirer of his, one Dr. Richard Hobson, has given to the world an account of this ornithological asylum; and it is certainly very curious. The name of the place was Walton Hall, near Wakefield; and it seems to have been peculiarly well adapted for the purpose to which it was put. It was situated on an island, approachable only by an iron footbridge, and having no other dwellings in its immediate neighborhood. The lake in which it stood gave the means of harboring waterfowl of all kinds while the "packing" of carrion crows in the park exhibits proof of the protection afforded by even the mainland portion of the estate; it was sufficiently extensive to allow of portions being devoted to absolute exclusion, for those birds which are naturally disposed to avoid the haunts of man. "Two-thirds of the lake, with its adjacent wood and pasture land, were kept free from all intrusion whatever for six successive months every year; even visitors at the house, of whatever rank, being 'warned off' those portions set apart for natural history purposes. Even the marsh occupied by the herons was forbidden ground throughout the whole breeding season, unless in case ef accident to a young heron by falling from its nest; in which case aid was afforded with all the promptitude exhibited by the fire-escape conductors for the safety of human life."

The surroundings of the mansion itself were quaint and exceptional, exhibiting the eccentric character of their proprietor. Item, a magnificent sun-dial—constructed, however, by a common mason in the neighborhood—composed of twenty equilateral triangles, so disposed as to form a similar number of individual dials, ten of which, whenever the sun shone, and whatever its altitude. were faithful timekeepers. On these dials were engraved the names of cities in all parts of the globe, placed in accordance with their different degrees of longitude, so that the solar time of each could be simultaneously ascertained. Near this sun dial was a subterraneous passage leading to two boat houses, entirely concealed under the island, furnished with arched roofs lined with zinc plate, and arrangements for slinging the boats out of water when they required painting or repair.

Four sycamore trees, with roosting branches for pea hens, and a fifth, whose decayed trunk was always occupied by jackdaws, screened the house from the north winds. Close to the cast-iron bridge entrance was a ruin, on the top of whose gable, at the foot af a stone cross twenty-four feet above the lake, a wild duck built her nest, and hatched her young for years. A great yew fence enclosed this ruin on one side so that within its barrier birds might find a secure place for building their nests and incubation. For the special encouragement and protection of the starling and the jackdaw, there was erected within this fence a thirteen feet high stone and mortar built tower, pierced with about sixty nesting berths. To each berth there was an aperture of about five inches square. A few, near the top, were set apart for the jackdaw and the white owl. The remaining number were each supplied at the entrance with a square loose stone, having one of its inferior angles cut away, so that the starling could enter, but the jackdaw and owl were excluded. The landlord of these convenient tenements only reserved to himself the privilege of inspection, which he conld always effect by removing the loose stone.

The lake had an artificial underground sluice, which issuing out at a little distance into sight, furnished the means of cultivating a knowledge of the mysterious habits of the water rat; this stream then passed through one of the lovliest grottos in England. Near this place were two pheasantries, the central portion of each consisting of a clump of yew trees, while the whole mass was surrounded by an impenetrable holly fence; the stable yard was not far off; and hence the squire had infinite opportunities of establishing the important fact, as he considered it, that the game cock always claps his wings and crows, whereas the cock pheasant always crows and claps his wings. Mr. Waterton's interest in natural history was, however, by no means confined to the animal creation. He concerned himself greatly with the culture of trees (though by no means of land) and hailed any *lusus naturæ* that occurred in his grounds as other men welcome the birth of a son and heir. Walton Hall had at one time its own corn mill, and when that inconvenient necessity no longer existed, the millstone was laid by in an orchard, and forgotten. The diameter of this circular stone measured five feet and a half, while its depth averaged seven inches throughout, and its central hole had a diameter of eleven inches. By mere accident, some bird or squirrel had dropped the fruit of the filbert tree through this hole to the earth, and in 1812 the seedling was seen rising up through that unwonted channel. As its trunk gradually grew through this aperture and increased, its power to raise the pondrous mass of stone was speculated upon by many. Would the filbert tree die in the attempt? Would it burst the millstone? Or would it lift it? In the end, the little filbert tree lifted the millstone, and 1863 wore it like a crinoline about its trunk, and Mr. Waterton used to sit up-

on it under the branching shade. This extraordinary combination it was the great naturalist's humor to liken to John Bull and the national debt.

In no tree fancier's grounds were there ever one-tenth of the hollow trunks which were to be found at Walton Hall; the fact being that the owner encouraged and fostered decay for the purpose of his birds' paradise. These trees were protected by artificial roofs in order to keep their hollows dry, and fitted thus for the reception of any feathered couple inclined to marry and settle. Holes were also pierced in the stems, to afford ingress and egress; and one really would scarcely be surprised if they had been furnished with bells for "servants" and "visitors." In an ash tree trunk thus artificially prepared, and set apart for owls (the squire's favorite bird), an ox-eyed titmouse took the liberty of nesting, hatching and maturing her young. Mr. Waterton attached a door, hung on hinges, to exactly fit the opening in the trunk, having a hole in its interior portion for the passage of the titmouse. The squire would daily visit his little tenant, and opening the door delicately drew his hand over the back of the sitting bird, as though to assure it of his protection. But unfortunately, one year, after the bird had flown, a squirrel took possession of this eligible tenement, and although every vestige of the lining of the nest was carefully removed, no titmouse or any other bird ever occupied it again.

In May, 1862, the squire pointed out to the author no less than three bird's nests in one cavity—a jackdaw's with five eggs; a barn owl's with three young ones, close to which lay several dead mice and a half-grown rat, as in a larder; and eighteen inches above the owl's nest, a redstart's containing six eggs! Our author deduces from this circumstance, that in an unreclaimed state, birds, although of different species, are not disposed to quarrel; and the fact that near this "happy family" a pair of water-hens hatched their eggs in a perfectly exposed nest, under the very eyes of two carrion crows who occupied the first floor of the same tree, an alder, without the least molestation, seems to confirm this view.

In this Garden of Eden, however, all sorts of anomalous things seem to have been done by birds. In a cleft branch of a fir tree, twenty-four feet from the ground, a peahen built her nest, through which piece of ambition, since falling is much easier to learn than flying, she lost all her young ones. In the branch of an oak, twelve feet from the ground, a wild duck nested, and brought down all her brood in safety to their natural element. A pair of coots built their nest on the extreme end of a willow branch closely overhanging the water; but the weight of the materials, and especially of the birds themselves, depressed it so that their habitation rested on the very surface of the water, and its contents rose and fell with every ripple; and, finally, another pair of coots who had built their house upon what they considered *terra firma*, found themselves altogether adrift one stormy morning, and continued so, veering with the fickle breeze for many days, until at last the eggs were hatched, and their young family became independent and could shift for themselves. All these minutiæ were carefully watched by the squire. An excellent telescope enabled him to perceive from his drawing-room window the manœuvers of both land and water fowls. "You could carefully scrutinize their form, their color, their plumage, the color of their legs, the precise form and hue of their mandibles, and not infrequently even the color of the iris of the eye; also their mode of walking, of swimming, and of resting. You could distinctly ascertain the various kinds of food on which they lived and fed their young. You could see herons, the water hens, the coots, the Egyptian and the Canada geese, the carrion crows, the ring-doves (occasionally on their nests) the wild duck, teal, and widgeon." No less than eighty-nine descriptions of land bird, and thirty of water-fowl, sojourned in the grounds or about the lake of Walton Hall. In winter when the lake was frozen, it was literally a fact that the ice could sometimes not be discerned, it was so crowded by the thousands of water fowl that huddled rogether upon it without sound or motion.

Mr. Waterton, it may be easily imagined, was himself no sportsman, but it was his custom to supply his own table on a fast day (he was a Roman Catholic) with fish shot by himself with a bow and arrow. Otherwise he made war on no living creature, except the rat: the "Hanoverian" rat, as he designated him with bitterness; and even then he preferred to exile rather than destroy. On his return home from his famous wanderings in South America, he found the hall so infested with rats that nothing was safe from them. But having caught a fine specimen of the "Hanoverian" in a "harmless trap;" he carefully smeared him over with tar, and let him depart. This astonished and highly-scented animal immediately scoured all the rat passages, and thus impregnated them with the odor of all others most offensive to his brethren, who fled by hundreds in the night across the narrow portion of the lake, and were no more seen. Though very bigoted in religious matters, the squire was indeed a most tolerant and tender-hearted man. He built a shelter upon a certain part of the lake, expressly for poor folks, who were permitted to fish whether for purposes of sale or for their own dinners; and notwithstanding that it was his custom to dress like a miser and a scarecrow, and to live like an ascetic, sleeping upon bare boards with a hollowed piece of wood for a pillow, and fasting much longer than was good for him, he was very charitable and open-handed to others.

It must be confessed, however, we gather from this volume that the great naturalist was, out of his profession, by no means a wise man, and certainly not a witty one. He loved jokes of a schoolboy sort and indulged in sarcasms more practical than delicate. The two knockers of his front door were cast from bell metal, in the similitude of human faces, the one representing mirth, and the other misery. The former was immovably fixed to the door, and seemed to grin with delight at your fruitless efforts to raise it; the latter appeared to suffer agonies from the blows you inflicted on it. In the vestibule was a singularly conceived model of a night-mare, with a human face grinning and showing the tusks of a wild boar, the hands of a man, Satatanic horns, elephant's ears, bat's wings, one cloven foot, one eagle's talon, and with the tail of a serpent; beneath it was the following motto:—

Assidens præcordiis
Pavore somnus auferam.

It was his humor, more than once, when between seventy and eighty years of age to welcome the author when he came to dinner, by hiding on all fours under the hall table, and pretending to be a dog. He made use of his wonderfnl taxidermic talents to represent

many individuals who took a leading part in the Reformation by loathsome objects from the animal and vegetable creation, and completed the artistic group with a sprinkling of "composite" demons. He was seriously vexed, and behaved very rudely to a stranger under his own roof, who had profanely designated his favorite (stuffed) Bahia toad as "an ugly brute."

These and similar instances of bad taste we think Dr. Hobson might have left unrecorded with advantage. Still, there was much to like as well as to admire about the great Naturalist. No museum of natural history elsewhere could compare with the beauty and finish of the specimens, prepared by the squire's own hand with wonderful skill and patience, which adorned the inside of Walton Hall. "Not even living nature," says our author, "could surpass the representations there displayed." In altitude, you had life itself; in plumage, the lustrous beauty that death could not dim; "in anatomy, every local prominence, every depression, every curve, nay, the slightest elevation or depression of each feather." The great staircase glowed with tropic splendor. At the top of it was the vertical cayman mentioned in the Wanderings, on which the squire mounted in Essequibo, and the huge snake with which he contended in single combat. Doubts have been thrown on both these feats, but Dr. Hobson relates instances of presence of mind and courage shown by the squire in his own presence, quite as marvelous as these. Wishing to make experiment as to whether his Woorali poison, obtained in 1812 from the Macoushi Indians, was more efficacious than the bite of the rattlesnake, he got an American showman to bring him twenty-four of these dangerous reptiles, and took them out of their cases, one by one, with his own hand, while the Yankee fled from the room in terror, accompanied by very many members of the Faculty, who had assembled to witness the operation. In his old age, he alone could be found to enter the cage of the Borneo orang-outang at the Zoological Gardens, in order, minutely to inspect the palm of his hand during life, and also the teeth. It was with difficulty that he obtained permission to run this hazard, the keepers insisting upon it, that the beast would "make very short work of him." However, nothing daunted, the squire entered the palisaded enclosure. "The meeting of these two celebrities was clearly a case of love at first sight, the strangers embracing most affectionately, kissiug one another many times, to the great amusement of the spectators. The squire's investigations were freely permitted, and his fingers allowed to enter his jaws; his apeship then claimed a similar privilege, which was courteously granted after which the orang-outang began an elaborate search of the squire's head.

The strength and activity of Waterton were equal to his physical courage, notwithstanding that he was wont to indulge in venesection to a dangerous extent, always performing that operation himself even to the subsequent bandaging. At eighty-one, the supplenesss of his limbs was marvelous; and at seventy-nine years of age our author was witness to his scratching the back part of his head with the toe of his foot! Death, however, claimed his rights at last in the squire's eighty-third year.

Charles Waterton lies buried in a secluded part of his own beautiful domain, at the foot of a little cross with this inscription written by himself:—

Orate
Pro anima Caroli Waterton,
Viatoris:
Cujus jam fessa,
Juxta hanc crucem
Hic sepeliuntur ossa.

Even those iron limbs of his grew weary and he died.—*Chambers Journal.*

Geology of North and South America.

The first lecture of Prof Agassiz' course on South America before the New York Association for the Advancement of Science and Art, was delivered to a large audience on the 5th of February, 1867, and was reported in the *Scientific American* as follows:

In substance it was a general statement of the geological origination and structure of the continent North and South, with a somewhat too hurried elucidation of the general principles of geology through which its history is revealed.

A remarkable analogy was traced between the geological histories of North and South America, each revealing three grand structural epochs, three successive upheavals of the crust of the earth, and three continental walls thus successively erected in the form of a triangle. In both divisions, this triangular framework stands in about the same position, like an italic *V*, as we view the map, with its open top closed. The side first erected, in both cases, was the northern, extending from east to west, constituting the northern (central) United States, British America, etc., in the one, and the plateau of Guiana in the other.

The vast contraction of the crust of the molten globe in cooling and thickening progressively—beneath the boiling ocean which still cooled it and still by its increasing coolness was more and more condensed upon it from the enveloping vapors—this tremendous contraction could not but cause the violently compressed mass within to break its shell and make room for itself, wherever the shell was weakest. At the same time, the cooling and contraction going on upon the exterior surface of the crust while the interior surface lay half fused upon the molten mass within, necessarily parted the exterior surface in great fissures, weakening the crust and permitting a grand upheaval along the line of fissure to relieve the pent and laboring ocean of fire beneath. Precisely in accordance with this effect we find the crust disposed in many mountainous districts, of which the Jura is a beautiful example. Passing over successive mountains and valleys varying thousands of feet in elevation, we trace our undulating crust of identical rock throughout, but broken at the summits and falling off each way like the roof of a building from its ridge.

It is worthy of remark that the oldest upheavals in the northern parts of North and South America respectively, appear to have been broader, less violent and less sharply defined, while the latter upheavals have been narrower and loftier, and the latest, narrowest, sharpest and loftiest of all. This is what would naturally result from the causes above stated. In proportion as the crust of the earth was younger and thinner, in the earlier stage of its contraction, the inclosed molten contents would lift and stretch the yielding superincumbent crust in vast tracts, and thus make room for themselves with less difficulty and conclusive violence. Hence the oldest system of hills in both parts of the

continent, is altogether the lowest; not to speak here of the longer continued abrasion, which but partially accounts for their more rounded form. Afterward, when the crust of the earth had grown much stronger, and contracted upon the molten world within with greater power and persistency, the force beneath accumulated until it burst up the crust with great violence under the line of an exterior fissure or rather series of fissures, extending northeast and southwest; and the second great wall, the Alleghanian system, then a vast promontory dividing the North Atlantic from the North Pacific, was erected. Any one who ever uoticed the series or system of fissures provided by contraction in a solidifying surface, irregularly huddled, and yet running generally in one direction, may observe just such another system in the mountains on the map of our Atlantic states. (It is but fair to remark that we are not attempting a report of Prof. Agassiz' lecture, but a sketch of his leading points, with explanations and amplifications designed for the instruction of our readers, for some of which he is not responsible.)

At the same time with the Alleghanian system—as proved by the cretaceous formation abuting upon the primitive rock alike in both regions—the plateau of Brazil rose above the water, forming in like manner the southeastern wall of South America, and dividing the South Atlantic from the South Pacific. North and South America, at the same time, were two great *L*-shaped islands with the ocean flowing unobstructed all around and between them, and in their then form incapable of embosoming a basin of productive land for the sustenance of organic nature and of man.

The next step in the task of Providence was to throw up a third barrier which would complete the necessary enclosure. After a contraction of the now strengthened crust, far more persistent and tremendous than it had ever before been capable of, a fissure system was opened on the exterior surface which may be traced on the map through all its intricacies, in the branching and interlacing of the mountains all the way from Cape Horn to Bhering's Straits; and now the intolerably compressed interior shot upward with the suddenness of explosion, all along that fissure system, lifting the sharp volcanic peaks of the Andes and the Sierras to the sky, and finishing at one stroke the continental frame of this western world. A receptacle was now formed for land, soil, vegetation, animal life and man; a wondrous "coffer dam" erected in the globe of waters, for Nature henceforth to work in undisturbed, to pnlverize the rocks, mix and inpregnate the elements, and clothe the stony skeleton with blooming flesh.

Carniverous Pine Grosbeaks?

The following appeared as an editorial in a recent issue of the *Saint John* (*N. B.*) *Globe:*

"An observer of winter sights and scenes some time ago called the attention of the *Globe* to the presence in groves and gardens near the city of the strong billed and prettily plumaged bird, familiarly known as the Pine Grosbeak. Scarcely a winter passes without this bird paying a visit to St. John and its vicinity. Although of late years the Pine Grosbeak seems to have grown scarce in numbers, the present year it is widely distributed, as several of our Lower Canadian and Eastern Maine exchanges contain references to its presence. The bird is very tame. It feeds principally upon such berries as it may find and largely upon the red berry known as the rowan, the fruit of the mountain ash. But the *Globe's* informant made an interesting observation and one to which it may be well to draw the attention of the naturalist, and that is that the Pine Grosbeak does not disdain for its morning breakfast an English Sparrow. The evidence of this was clear and convincing the Grosbeak—not one or two, but more—being seen with the slaughtered Sparrow in its beak. There seemed to be no mistaking the bird slayer, for it had the brilliant coloring of the Grosbeak which is wanting in the 'shrike,' a regular Sparrow killer; but not, as far as we know, a regular visitor here."

To the above Mr. A. Gordon Leavitt of Saint John promptly and undoubtedly correctly replied as follows:

"As I take considerable interest in our native birds, I was greatly surprised at the account given in your issue of Jan. 31, *re* the Pine Grosbeak breakfasting on the English Sparrows. Now, I would not for one instant doubt but that your informant had the very best of intentions, but to read that one member of the Finch family should be found feasting on another (and that family being well known as seed and berry eaters), left a feeling of doubt.

"I am well aware that there have been and always will be numerous erroneous statements made regarding the food and habits of birds, and chiefly on account of persons placing too much importance on what they 'were sure they saw.'

"There is but way known to me by which one who would study birds properly can find out exactly what their food consists of, and that is by dissection, for there is hardly any room for doubting that what is found in the crop or gizzard has been eaten by the bird.

"Now if your informant is ever again privileged to watch what he or she considers a 'Grosbeak breakfasting on an English Sparrow,' could succeed in bagging one or two of the slayers and would forward the same to me, I would esteem it a favor and would with the aid of knife and glass, endeavor to make sure as to whether the flesh of the slain had been eaten or not.

"A statement such as the one referred to should call forth answers from all local naturalists who take an interest in our birds and their habits. For my part, I feel reasonably sure that the slaughterers were Shrikes, for, although the males when in full plumage are bluish ash, in the young that color is absent and while the upper parts are quite brownish, the under parts are brownish white.

"Of course the Pine Grosbeak may be guilty of the charge, but I firmly believe that any member of the Finch family would starve before it would become carnivorous."

It might not be out of place for ye Editor to add in this connection that the Pine Grosbeak is a rare winter visitant with us in Western New York but this winter they seem more abundant than usual and specimens have been taken in a number of localities.

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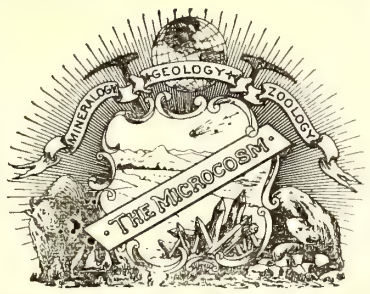

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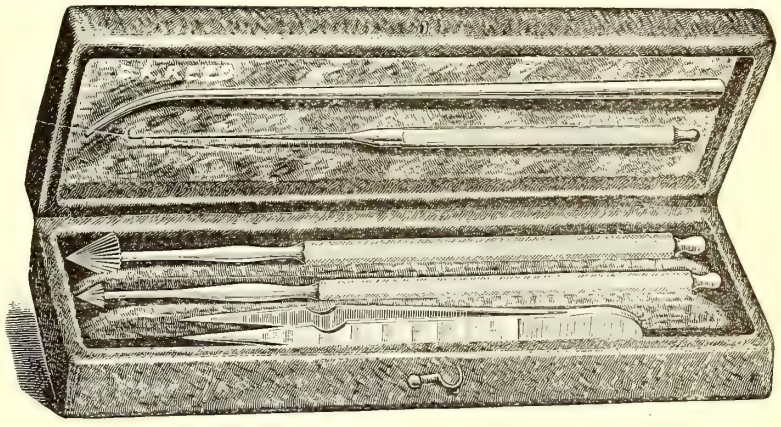

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NATURAL SCIENCE NEWS

VOL. II. No. 7. ALBION, N. Y., MARCH 14, 1896. Whole No. 59.

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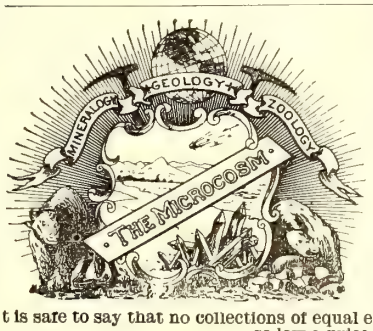

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Albion.....	7 00	9:10	11:35	3:25	6:50	11:06
Lockport.....	8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge..	8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....	8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5:5(
Niagara Falls.	6:35	8:05	11:18	1:40		6:00
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion..... ....6:50	8:15		1:00	3:25	6:45	7:50
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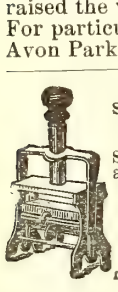

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Natural Science News.

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Spiders' Silk.

If you can picture to yourself a mass of pure and yellow gold, which not only reflects the light as from a smooth and polished surface, but which has all the depth and softness of liquid amber, you may realize in some degree the wonderful appearance of a sheet of spiders' silk as seen in the sunshine; and even in the shade its luster is greater than that of gold. But to compare the silk with gold is to tell only one half of the story; for the same spider yields silver as well, so that you may draw from its body a thread of gold or a thread of silver, or both threads together; their union giving silk of a light yellow color.

These two differently-colored silks are drawn from two different parts of the spinning organ, which will be described hereafter; and not only are their colors thus distinct, but also their other physical properties;for the yellow is elastic, and may be stretched slightly and regain its former length, while the white is inelastic, and at once crinkles up when tension is removed during the process of drawing it from the spider. The two kinds of silk are employed also in the construction of different parts of the web; but that has been sufficiently described elsewhere.

Beauty and strength are natural partners, and we do not look in vain for the latter quality in spiders' silk. It is indeed something prodigious as compared with even the strength of metals. A bar of iron one inch in diameter will sustain a weight of twenty-eight tuns; a bar of steel fifty-eight tuns, and, according to computation based upon the fact that a fiber only one four-thousandth of an inch in diameter will sustain fifty-four grains, a bar of spiders' silk an inch in diameter would support a weight of *seventy-four tuns.*

DISADVANTAGES OF SPIDERS' SILK.

Aside from its excessive fineness, the only thing to be said against the silk is the small quantity which a single spider will yield, as compared with the production of a silk-worm. And when it is admitted that the latter spins a big cocoon which yields upon the average, three hundred yards of silk, weighing about three grains, while the average length which can be reeled from a spider at one time is only one hundred and fifty yards, which is so much finer as to weigh but one-twentieth of a grain, our quantitative comparison looks rather discouraging and lessens the satisfaction we had derived from the previous comparison of quality

But there are several other facts to be considered which tend to greatly reduce this discrepancy between the production of the two insects; some of these relate directly to the one and some to the other.

Let us first reduce the silk furnished by the worm from its apparent to its real amount. Three grains represents the average gross weight of silk yielded by one cocoon; but the fiber is so covered with gum which would materially interfere with its manufacture that it has to be cleansed by prolonged boiling in soap and water, which process costs each cocoon one quarter of its weight, leaving the real amount of available silk supplied by each worm, two and a quarter grains; but even this is forty-five times the yield of a single spider, and any practical inquirer will not gain much comfort from the comparison. Having now placed the worm's production in its true light, what can we say of the spider to increase the statement of its yield? So far from being destroyed, as is the worm, for the sake of one cocoon, and thereby being prevented from further service in way of laying its eggs, the spider is not at all injured by the reeling process and after a day or two of rest, is ready to yield us a second hundred and fifty yards, more or less, and then a third and a fourth, until it has been reeled from say twenty times in the course of a month, nor is this probably the limit of their capacity, under favorable conditions, but it will be seen that,even granting it to be so, and its season to be limited to a month, the spider of a whole season is twenty times as valuable as the spider of a single day, and the total yield would be about three thousand yards weighing just one grain. Now, the worm yields only two and a quarter times as much as this, and that is the end of it. Like the swan, it expends all its life in a last effort; but the spider, like the canary, does something every day, and when no longer able to produce silk, can provide for future generations by laying five hundred or more eggs.

Admitting then that a worm yields two and a quarter times as much as a spider, what is the number of each required for a piece of woven silk? A yard of cloth varies greatly in weight, and somewhat too in quality, and of course in cost; the quality we cannot here consider,but as to weight and cost, a cheap silk at two dollars and fifty cents weight from one-half to three-fourths of an ounce per yard. A rich silk at from six to ten dollars weighs two ounces or a little over. And between these two, the ordinary grades in which the majority of people are interested cost from three to five dollars per yard, and weigh from one to one and a quarter ounces.

An ounce is four hundred and thirty-seven and a half grains (avoirdupois), and as each spider yields one grain, it will require, in round numbers, four hundred and fifty to produce a yard of silk; or fifty-four hundred for an ordinary dress pattern of twelve yards. The number of worms required for the same is to be ascertained by dividing those figures by two and a quarter, which makes, in round numbers, two hundred worms for a yard, and twenty-four hundred for a dress.

And now supposing (for the sake of comparison) that each spider costs as much time and trouble and money as a worm, and that therefore, a fabric of spiders' silk costs two and a quarter times as much as one of ordinary silk, that fact by no means indicates that the former is not worth having.

Honey costs more than molasses, but every body of taste thinks it worth the difference; a steel knife is all very well, but a silver one is worth the difference in cost to all who can afford to pay it; a cotton or woolen dress is not to be despised by any one, but every woman prefers a silken gown, and counts the increased price as small compared to the greater satisfaction it affords; and now, so far at least, as we can judge, as honey is to molasses, as silver to steel, as silk to cotton, so is the product of our spider to that of the worm; and the superior beauty, and elegance, and delicacy of the fabric will, no doubt, more than compensate for the difference in its cost.

MACHINERY.

First catch your spider, is a necessary preliminary, and although this matter properly belongs to the last division of our subject, it may be well to quiet the apprehensions of any one who suddenly recollects the big body, and long legs, and sharp jaws of the *Nephila plumipes* and fears that it is an untamable creature which will resist an attempt to abstract its silken stores. I will leave the complete removal of this apparent obstacle until we come to consider the spider itself in all its relations, and merely say now that it seldom tries to escape or to bite; that you have only to get its body between thumb and finger so that two legs are turned backward, to be perfectly safe from injury by its jaws.

After many trials, the contrivance which I have adopted consists of two large corks, a bent hair-pin, two large common pins, a bit of card and a bit of lead. One cork serves as a base. Its bottom is loaded with the lead, and one half its top is beveled off at an angle of forty-five degrees; upon the oblique surface so formed is fixed the piece of card, its upper edge projecting an eighth of an inch; into the remaining half of the upper end is cut a broad and shallow grove, and upon each side of this groove, at the middle of its length, the two pins are stuck into the cork, so as to be about an inch apart; and now when the insect is held with the legs behind the back and laid upside down into the groove, the projecting shoulders of the abdomem bring up against the edge of the card, and the legs are kept in front of the two pins. The upper cork is rounded and smoothed at its smaller end, and a hair-pin is pushed obliquely through the lower corner of the larger end so as to form an angle of forty-five degrees with the lower side; one or two tacks will retain the pin in its place; at the distance of a quarter or third of an inch from the cork, the pin is bent outward on both sides so as to double its width, and then straightened. Now push the ends of the pin down between the card and the first cork, with the rounded end of the second cork projecting over the card. This may be done with the left forefinger, while the first cork is held between the second finger and thumb; the spider's abdomen is now put through the opening formed by the pin on each side, the cork above and the cork below; its abdomen rests in the groove, the shoulders come against the card, the upper cork is pressed down so that the narrow part of the pin embraces the rounded upper cork, the lower one is fixed upon a screw, turned around so that the abdomen of the spider points to the right; and we are ready to begin the reeling process.

The reel is either a cylinder or ring of some smooth substance as hard rubber, or consists of a set of radii set into an axle, and having their ends bent at a right angle and enameled so as to present an even surface to the delicate silk. The reel I used had radii about three inches, in length; this made the whole diameter six inches, and of course at every revolution eighteen inches of silk were reeled upon it; the motion could be quite rapid, and if steady, one or even two feet of silk could be drawn each second, so that a very few minutes would suffice to exhaust the day's supply of a spider.

The thread of a single spider cannot be drawn from a reel In order to obtain a compound thread of such size as to permit us to unwind it from the reel, we have only to arrange a large number of spiders, and carry their combined threads upon the reel; by well-known mechanical contrivances the reel itself (which must not be a slender spindle) may be made to revolve in two directions, so as to twist the thread properly, and then there seems to be nothing to hinder carrying the silk directly from the spider's body to the sewing machine or the loom, for there is no gum to be removed, and its natural colors are beyond the capability of art.

The spider can retard the flow of silk from its spinners by strongly pressing them against each other, but if the reeling is regular it cannot wholly prevent it.

Under the head of disadvantages we must include two very unpleasant facts: 1st, that the young devour each other to such an extent that, as a rule, only a very few out of the several hundred hatched in every cocoon ever reach the age when they separate and build isolated webs; and 2d, that the female spider is apt to devour her partner sometimes before, but more often after the impregnation of the eggs.

The latter fact is not of so much consequence; for the females are the spinners, and are always in the majority, not only in the number but also in the size of the individuals (the females being about 125 times as large as the male), and the males can be easily protected.

But the terrible destruction which, in a state of nature, seems necessary in order that a portion shall grow at all, is a very serious obstacle in the way of any increase of the species. This killing of each other, however, is not, apparently, from malice but from hunger, and both experiment and inference indicate that it may be almost entirely prevented by supplying the young and growing spiders with suitable food. Each cocoon spun by the parent spider contains from hundred to a thousand eggs, all of which hatch, generally in the course of a month. For several days and even weeks they remain huddled together in the cocoon, and whatever growth they have during that time, aside from absorption of moisture from the air, must be at the expense of the community; nor can it be well prevented. But after this time has passed, and they begin to come forth, either singly or in parties, and spin their little lines over the leaf to which the cocoon is attached, they may be in a great measure prevented from further cannibalism by putting in their reach drops of blood or crushed flies, or very minute flies, or bugs of almost any kind.

If large numbers of them are to be reared, a special apartment should be arranged for them; each cocoon should be attached to the top of a wire frame of, say a foot in height and nearly the same diameter, which must stand in a shallow dish of water, lest the spiders travel about the room and collect in great numbers at the top, where they could not be cared for. They will spin at first an irregular common web, and eat together from whatever food falls upon it. As they grow larger they may be sep-

arated by inverting another frame over the first; for they always ascend.

After several weeks, they suddenly change their instincts; and from living together in some sort of fellowship, which really does not seem to be incompatible with their peculiar style of eating each other up, they attempt to isolate themselves, and to make each for itself its own web, which is now geometrical, like that of the full-grown spiders; and as they now need more room, and will jealously resent any trespassing upon their particular territory, it is time to remove them to the frames, which will be described in the following section.

It may be impossible to say how large a percentage may by this plan be reared from one cocoon; but the fact that two or three out of every hundred have been saved at a first trial, under very favorable conditions, show what may be expected of a plan like the above systematically conducted upon a large scale.

As to the food of the young, there are some substances which breed the smaller kinds of flies, and which could be kept in a place communicating with the outer air in another room; but covered with fine wire netting. This would exclude the larger species, but would admit the little ones to deposit their eggs upon the meat, etc., and the flies produced therefrom could enter the apartment.

The growing spider like the worm, casts its skin several times before reaching its full size, and in both the operation is attended by some danger.

It is no doubt, a disadvantage, that the spider, in moulting, is obliged to draw eight such very long legs from their old skins; but although the legs may be occasionly pulled off in the process, yet they generally separate at the second joint from the body, and thereby no blood is lost; and, moreover, although each pair of legs has its its appoined office, they act vicariously. To offset the liability to injury in consequence of their more complicated structure, the spiders are not known to be subject to diseases, such as have so terribly destroyed the worms of late years; but we cannot be sure that some maladies will not follow their domestication.—*B. G. Wilder, M.D., in an old Galaxy.*

Games Among Crows.

I had read in various magazines of the times at which our common Crow held high carnival and throwing off dull care engaged in games not unlike those played by ourselves at school, and I had hoped but hardly dared expect to have the rare fortune to behold a game of this kind as played by our friend *Corvus.*

The day was one of those mild September days, when nature seemed to be at her best, when the earth was resplendent with the beauties of the fading year and in the language of the poet:

"And Nature's voice says in mystic words,
'The green fields wait for thee.'"

In company with my brother I had repaired to the woods and in studying the birds was particularly attracted by the loud cawing of a small flock of Crows which had assembled in the top of a blasted hickory snag about twenty-five yards distant.

The locality was in the vicinity of a clearing, to the north of which was an open tract and beyond this a dense wood. In the clearing stood the hickory snag already referred to. With many loud guffaws the flock assembled in the top of the snag and then all was silent. A Crow broke from the flock and winged his way toward the wood.

Upon reaching this he gave a loud call. This was evidently a signal to the pursuing party for they immediately broke for the wood just entered by the leader, but at the edge of the wood they changed their tactics, one following the leader into the brush, another making a circle about the wood and the remaining four perched upon a tree close at hand. The one who had made the circuit of the outskirts of the wood having completed his mission returned to the tree in which the guard-party was stationed.

Another sailed out from the tree and upon his return was relieved by another. During this time nothing was seen of the leader and but for a few hoarse croaks uttered at intervals, one might have supposed that he might have quitted the wood. This croaking seemed to chagrin the birds at not being able to find their companion, while he was in easy hearing for they "gave him the horse-laugh" as if to imply that they would catch him yet.

Suddenly there was a loud cawing from the innermost depths of the wood which was answered from the tree, a "howling commotion," and he appeared from the edge of the brush where he was pursued by the six members of the "out" party. They gyrated in front of him and performed all manner of ruses to impede his progress. In the whirring of wings and the ever-moving mass of Crows I could not determine whether or not they patted him three licks on the back as we were in the habit of doing at school, but he ceased his efforts to escape and succumbed to the inevitable.

They sailed away to a new quarter and we saw no more of them, but all day long we heard their far away calls, their guffaws of laughter and left us to muse upon what we had seen.

I leave the reader to judge for himself which of his school-boy games the game most resembles. To my notion it more nearly corresponded with the game known to the boys of my neighborhood as "Run, Sheep, Run."

If anyone desires to study the Crows in their haunts let him seek the solitude of the woods and devote a day to their exclusive study and he will be amply repaid.

C. L. Smith.
Oblong, Ills.

A New Parasite.

During the past season I have studied, somewhat, our commonest "digger wasp" here (DeWitt, Neb.) identified as *Bembex nubilipennis.* This species digs burrows about 18 inches in length in the dry compact earth of roadways, paths and bare places in suitable localities, which they provide with flies upon which the egg is laid.

A seemingly new fact in regard to this species or any of the genus *Bembicum,* is that this species is parasitized by a *Tachina.* Of a large number of burrows which were dug into, all were found to contain in the cavities in which was the larva of the wasp, the larvæ of a *Tachina.* There were from four to twelve in each cavity. They were feeding on the provisions made by the wasp for her own larva. In one instance no larva of the wasp or empty pupa case was found, but the cavity contained eight of the Dipterous larvæ and an abundant supply of food. Pupæ were also found in same place as the larvæ.

Specimens of full-grown larvæ which were secured were placed in earth, pupated and gave out the imago in eighteen days between August 18th and September 5th. Of another lot secured on September 5th only one has emerged to date. A specimen was submitted to Prof. S. W. Williston, who was unable to determine the species, it being "in all probability yet undescribed." It belongs to the genus *Prosphorysa*.

No flies resembling these at all were noticed about the holes or wasps, and I do not know how the flies gained access to the larval cavities, as in almost every instance the mouth of the burrow is carefully covered with earth by the wasp both when leaving the hole or remaining in for some time. In the latter case the dirt is pushed up from below, the angle of descent being small, so that the earth does not run down into the hole. The statement that no parasites are known that feed upon provisions of flies in the nests of any of the species of the genus *Bembecinus* is upon the authority of Prof. L. O. Howard.—*H. Anderson Lafler in Entomological News.*

The Mongoose in Jamaica.

At a recent meeting of the Boston Scientific Society, Prof. E. W. Forbush, State Ornithologist, presented a paper on *Birds Useful to Man*, in the course of which he had occasion to speak of introduced pests. This led directly to a consideration of the mongoose in Jamaica, concerning which he had some recent authorative statements. The story is a very interesting one, and shows the danger of introducing animals into a country where they will have a chance to increase too rapidly for the good of their new home.

It seems that there were rats in Jamaica which devoured the sugar cane. These rats were abroad in the daytime and really seemed to be quite a pest. The mongoose had a great reputation for its skill and value in India as a destroyer of snakes and other reptiles. So it was decided about a dozen years ago to introduce the mongoose into Jamaica to free the island from the rats. The mongoose began promptly to eat the rats, whereupon the rats climbed into the trees and became to some extent at least nocturnal. The mongoose finding that the rats were out of reach, tried the ground birds; finding them to its taste, it speedily began to exterminate them, and today it has practically destroyed the ground birds of the island.

Meanwhile the destruction of the birds brought another agency into action, the insects; and these increased marvelously. There was the cane grub, which did quite as much damage as the rats did in the beginning, while the ticks became numerous and a pest everywhere. The situation, therefore, is this: that the Jamaicans have still the rat, and they have the mongoose too, and the tick, and they have lost their ground birds, so that agriculture of some kinds is now impracticable and important sources of gain have passed away. The indications are that the mongoose is beginning to climb the trees, and if he does this he will exterminate the tree birds. The only outcome from the difficulty, according to the informant, seems to be the possibilify that the ticks will become so numerous that they will exterminate the mongoose; and then in time the former balance of animal life on the island may be restored.

An Exploring Expedition to the Interior of Labrador.

An expedition bound for the interior of Labrador will leave Philadelphia in June for the purpose of studying the Eskimo and collecting specimens of the flora and fauna of that region. G. H. Perkins of the class of '95, University of Pennsylvania, will be the commander, and the remainder of the party will consist of four students of zoology, geology, botany and archæology and a number of college students and others.

Professor Frank Russell, curator of the University of Iowa, accompanies the expedition as an archæologist.

The trip from St. John's, N. F., to Labrador will be made in the ship Kite. At St. John's the Philadelphia party will be joined by ten scientists sent out to explore the coast of Ellesmere Land, and also to discover traces of the ancestors of the Greenlanders, who, it is thought, came from that place. Professor Hite of the University of Pennsylvania, who is the originator of the expedition, said: "The party will leave Philadelphia about the middle of June. The ten scientists who will join our party at St. John's will be sent out by Dr. C. T. Mendenhall, superintendant of the United States coast geological survey; General A. W. Greely, Baron von Saurmajeltsch, J. A. W. Grip, envoy extraordinary from Germany to Norway and Sweden; J. W. Powell, director United States geological survey, and Baron Adolf Eric Nordenskjold of the Royal Academy of Science, Sweden.

"These persons have supplied the wherewithal for the researches of the scientists for a period of one year. The Kite, after leaving St. John's, will cruise around the gulf of St. Lawerence, making collections at the south coast of Labrador, visiting the island of Anticosti for Eskimo remains, and will then go north along the eastern coast of Labrador as far as Cape Chidley. Parties will be left at various points along the coast, supplied with tools and equipments necessary for their researches. At Clarence head, in James sound, Ellesmere land, it is proposed to leave the ten scientists, who will erect winter quarters and a general supply station there. They will make explorations until the six months of darkness come on, when they will return to Clarence head, starting out again in the spring. It is expected to explore at least 300 miles of Ellesmere Land, which in all probability is the original home of the ancestors of the present Greenland Eskimo, who must have crossed to Greenland over 1,000 years ago. Of these people the scientists are desirous of finding traces.

"The Kite will return to Labrador, picking up the various parties, and then keep on to St. John's, arriving about Sept. 12. She will return in 1897, carrying the same number of people and for the same purpose and will bring home the party of scientists from Ellesmere Land.

Professor Hite said that the university cruise to India in September would prevent his accompanying the expedition to Labrador.—*Philadelphia Press.*

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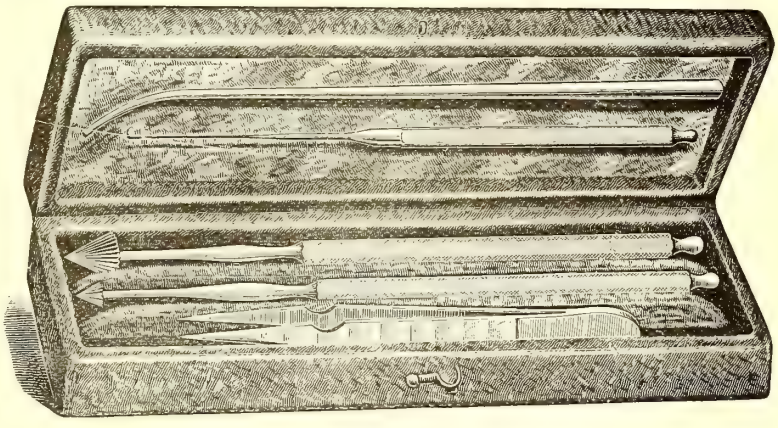

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NATURAL SCIENCE NEWS

VOL. II. No. 8 ALBION, N. Y., MARCH 21, 1896. Whole No. 60.

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Albion		7 00	9 10	1:35	3:25	6:50	11:06
Lockport		8:05	10:05	12.22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	11:00	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6 35	8 05	11:18	1:40		6 00
Susp. Bridge .		6:45	8.10	11:25	1:48		6:00
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:05	6:45	7:50
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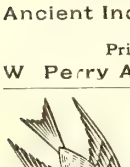

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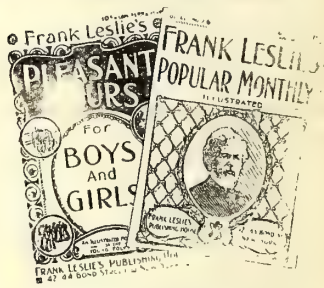

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The Primeval Flora.

The above topic formed the subject of a very interesting lecture by President Dawson, of McGill College, Montreal, at Steinway Hall, New York, on the evening of the 23d December, 1868. Notwithstanding the lecture embraced altogether too wide a field for anything like thorough treatment, the happy stlye and popular method adopted by the lecturer, made it very acceptable. After the usual introduction of the lecturer to the audience, President Dawson said: An ancient authority has defined geologists as a class of amiable and harmless enthusiasts, who are happy and grateful if you will only consent to give them an unlimited quantity of that which, to them, has, perhaps, the most value of all things, namely, past time. I confess to this definition of geologists, so far as my subject this evening is concerned, for I shall have to make a large demand upon your faith as to the extent of the past time, and shall have to ask you to give me all of it which you reasonably and conscientiously may. Geology, indeed, works strange revelations in our view of things, new and old. The primitive forests, and even the gray rocks and hills themselves are things not primitive and unchanging, not things, comparatively, of yesterday, the successions of olden forests and olden rocks that in dim and ghost-like procession recede from our view into the past of an antiquity, compared with which antiquities are things of yesterday. The murmuring pines, and hemlock, bearded with moss and in garments green, indistinct in the twilight, may stand like Druids of old with voices sad and prophetic; but they belong not to the forest primeval of the earth's younger days, though they may point backward to perished predecessors of truly old date, truly primitive and geological antiquity. It is to them that I must try to carry you back in imagination this evening to awaken those slumbering ages and make them green again in your eyes and vocal in your ears.

Transferring our thoughts to these old forests, and imagining their strange fantastic forms, and the singular creatures that lived beneath their shade, we shall find ourselves in a new world different from that which we inhabit: and differently peopled. Could we marshall in one view four or five planets, each clothed with the peculiar flora, and inhabited by the peculiar fauna of a distinct geological period, we should truly have before us so many distinct worlds with nothing to connect them with each other save only certain similarities of plan and conception. But when we view these several worlds as successive, and destined the one to prepare the way for the other. we can perceive relations of the most remarkable and unexpected character, and have presented to us a long protracted scheme of creation too vast to be contained on the surface of our planet at any one period, and representing with our present flora all the possibilities of vegetable existence, and all the uses, present and past, which plants can serve.

I have selected as the subject of this lecture one small department of the vast field of fossil plants, a department of peculiar interest as relating to the oldest known plants, and which as a special and favorite study of my own I must endeavor to make attractive to you. But I must not rest contented with this, but in justice to the subject must try also to present it in an orderly and systematic manner.

I must endeavor to give you something like a connected sketch of that primeval flora which is the subject of this lecture; and in order to do this, I must first say a few words on the relations of their primeval flora to existing plants; 2d, I shall say something of their relations to the geologic time; 3d, I shall enter upon the subject proper by describing to you some of the most remarkable plants that flourished in that primeval age; and, 4th, I shall conclude with noticing some of the uses of primeval flora to us, the practical use it serves to our present race; and I shall endeavor to give you, if possible, some idea of the light which geology gives us as to the first appearance of plants on our planet, and how far back they can be traced in geologic time.

First, then, I shall speak for the benefit of those who may not have pursued the study of botany, of the relations of existing planets, and the relation of the fossil flora to them. Taking the whole of the planets known to us, we shall find upon examination that they may be all divided into two great series; first, that series of plants in which we observe distinct flowers, and fruit containing seeds. These constitute the phenogamous plants of the botanist. Then we have a great class of plants of a lower and humbler organization, which are destitute of true flowers, and which instead of producing seeds, produce granules, performing the functions of seeds, called spores. These are the cryptogamous plants of the botanist. The whole vegetable kingdom is divided into these two great classes. Now, taking first the phenogams, we shall find three classes of them. We have first, that group of plants in which all our trees and shrubs and the greater part of our cultivated plants and weeds belong—the exogens, which have a distinct pith, and wood, and bark.

Then we have a class in which these features are more or less mixed through the entire structure, and in which there is little distinction of wood and bark, and of which the palms of the tropics and the grasses of our own latitude are examples. These are called endogens. A third class are gymnosperms, which have naked seeds, specimens of which are the well known pines and the sago of the tropics. Thus, to recapitulate, we have three groups of the phenogams, of which oak or maple, the palm, and the pine tree, are respectively representatives.

In the cryptogams we may also make a three-fold division respect-

ively represented by the ferns and club mosses, the common mosses, and lichens, fungi and seaweeds.

Next let us see what relation these primeval flora bears to that of modern times. Two relations are possible. First, that the primeval flora may belong to a different classification altogether; and second, which is the true supposition, that the whole flora of the earth, from the earliest geologic times, comes under one classification. This shows that, from the beginning of geologic time, one plan has been followed out in the construction of the vegetable kingdom, and that the whole vegetable kingdom consists not of the plants now living on the earth, but includes all the plants that have ever lived upon it. Again, there is another possibility, that the primitive flora may include representatives of all our modern classes of plants, or only some of them. The fact is, that it includes mainly representatives of some of them, and those of a medium grade, neither the lowest nor the highest, so far as the land flora is concerned. The fossil plants are not chiefly exogens or endogens, but gymnosperms. On the other hand the acrogens, or the highest group of the cryptogamous plants in our day were then the most abundant. The primeval flora, therefore, embraced the higher cryptogams and the lower phenogams. If we had known nothing of vegetation but that manifested by the primeval flora we should not have known the possibilities of the vegetable kingdom, either in its highest ranks or its lowest ranks, but only in the middle of the scale.

Next let us glance at the relations of the primeval flora to geologic time. The oldest rocks we know, the eozoic, have afforded no plants, so far as we know, at all. The next stratum, the paleozoic, includes the oldest land plants we know. But in the mesozoic period we arrive at a different flora, and in the cainozoic, or modern period, we have two other floras. It is the paleozoic flora only of which I shall speak tonight. During the whole of the paleozoic period, the seaweeds have existed. In the earlier periods the classes of acrogens and gymnosperms far exceeded the exogens and endogens, while the reverse is the fact at the present day. The warm and moist climate of portions of the southern hemisphere at the present day, now have a flora more nearly resembling the early epochs than any other portions of the earth. The uniformity of the flora of that early period indicates a temperature nearly uniform throughout the earth. At present we have in our atmosphere but a small quantity of carbonic acid gas. If we had more it would tend to make lhe climate more uniform, by preventing the radiation of heat from the earth. The carbon locked up in our coal mines, and then existing in the atmosphere, may therefore have been at least one reason for the uniformity of climate on the earth in the paleozoic period, the flora of that day indicating a warm and moist climate.

Next, looking to the flora of the plants, we will turn to the carboniferous period, when there was a vast amount of vegetation, afterward made fossil and becoming coal. In that moist, warm, but unwholesome atmosphere, we find the sigillaria, or seal-tree, one of those most abundant in the swamps of the carbeniferous period. Here we have a large tall stalk, without branches, covered with large leaves; or perhaps divided into a few branches. We have remains showing the ribbed structure of the stalk, and the scars of the leaves. There are no trees in onr latitude resembling it in structure. We know of the fruit of the sigillaria only by the abundance of a certain nut that is found around them. Trees of two and three feet in diameter were not uncommon. The root of this tree is more remarkable even than its stem, having attracted the attention of geologists before the stem, and obtained the name of stigmaria. These roots are bifurcated and spread out in a remarkably regular way, all the little rootlets spreading as regularly as leaves. These roots occur very often in the coal formation without the stems; and at first it was supposed that they were the whole of the plant. The first process in the formation of a bed of coal was usually the growth of a forest of sigillaria.

The next class are the calamites. The lecturer here related an anecdote of an unlearned individual who having been shown some specimens of ferns and calamites, the former being called filices, reported to his friends that he had seen the savant's "felicities" and "calamities." In one sense the calamites may be justly styled calamities, for they had been the subject of more dispute on the part of geologists perhaps than any other fossil plant. They seem to have grown on muddy flats along the margin of the sigillarian woods, resembling equiseta or mare's tails; and they are still preserved in coal formations in large numbers. The calamites seem to have preserved the sigillarian forests from the effects of inundation, by causing the mud to settle before the waters passed into the forests. The calamites thus contributed very much to the purity of our coal beds.

The next plant is the lepidodendron or scale-tree, of a size equal to the sigillaria, resembling our ground pines or club-mosses. This tree was more plentiful in the earlier coal formations than in later periods. Many other diagrams and petrifactions of fossil plants were here exhibited. The plants of the carboniferous period would have presented to our eyes a very monotonous appearance; for it was characteristic of the flora of that period that there was a large number of species, but few genera. There were also some plants more familiar to our eyes. The ferns are to be found in the coal beds preserved as beautifully as they could have been preserved in an herbarium. They resembled more closely the ferns of New Zealand or the Hebrides than the ferns with which we are familiar. Some of these ferns grew to the dignity and beauty of the palm-tree itself. One species was peculiar, having only two leaves at a time. We find sometimes in the coal-beds things looking like enormous brooms, which are tree-ferns, with roots sent out to straighten the stems.

We also find in the coal formation varities of pine, the wood of which much resembled our modern pines. It is remarkable that the pine is widely diffused at the present day; and it is not wonderful, therefore, that they should have existed in the carboniferous period. These pines have features more nearly resembling those of Australia and New Zealand than those of our climate. When wood is buried in the earth and its cells filled wfth stone, and the wood becomes coal; and this is the form in which we find these fossil remains. By removing the mineral we can observe the vegetable structure of the plants, and determine their character. Next to the soil on which we tread, the most valuable substance we have is mineral coal, which is derived from the plants of the carboniferous period. A bed of coal is usually composed of the remains of the trunk and bark

of sigillaria trees. Examining coal with a microscope, after proper preparation, we can see the structure of the wood from which the coal was derived. Of eighty-one distinct seams of coal in Nova Scotia, every one but two or three had sigillaria, either in the coal or immediately above or beneath it. The top of a coal seam is merely the debris of the last forest that grew on this swamp where the coal was produced. Great Britain annually consumes 100,000,000 tons of coal, and we know of nothing that will supply its place. The consumption of coal in America is already equal to the labor of 150,000,000 horses, and our coal beds are as yet hardly opened. All this power is extracted from the sunbeams of the paleozoic period. (Applause.)

What did these magnificent forests grow for? There seem to have been no higher animals to enjoy them. We know of no birds that lived among their branches. We know of a few insignificant reptiles that crawled beneath them but we know of nothing higher in that age. What were they created for? For two great purposes. First, to purify the atmosphere so that it might be made suitable for the higher animals that were to live in a future geologic period; and that very process of purifying the atmosphere was made means of laying up those enormous stores of fossil fuel upon which so much of our modern civilization is based. See how grand are the economies of nature, preparing far back in geologic periods before man existed, for the existence of the present state of the arts in the world.

Next to coal in its value comes iron; and although we are not so dependent upon the coal formation for iron as we are for coal, still we get an immense quantity of iron from the carboniferous rocks accumulated by the agency of these very plants; for as they went to decay, and were converted into coal they helped to gather together the particles of iron out of the clays and sands, and to store them up for us in iron ore. Therefore we owe to the growth of those old forests not only our coal but a large portion of our iron. And whether we look to the value of the coal in boiling the teakettle of which Prof. Silliman spoke to you in the last lecture or in the use of the iron which makes our iron horse, and the steam engine of our factories, we owe it all to the primeval plants, or rather the Maker and Creator of these old plants.

Now let me trace these plants a little further back than the period of the coal formation. If we go back from the carboniferous rocks to the Devonian, we shall find a different flora, which no doubt helped to purify the air, and prepare the world for the carboniferous flora. We have in Canada a bed of coal two or three inches thick, belonging to that epoch, and it is the only one I know in America. In this drawing, some of the plants of that period are represented; and here you find the sigillaria, the lepidodendron, the calamites, the pines, etc., as in the later period; so that you see that the Devonian flora was really not very different from that of the carboniferous period. The species are mostly different but the generic forms are the same. As a whole the Devonian flora may be characterized as less massive and magnificent, more delicate and slender in its proportions; not less beautiful but less useful perhaps in the accumulation for us of vast stores of fuel. If we go down below the Devonian rocks into the Silurian, we find a few plants; but in the lower Silurian formation we hardly find any traces of plants. Nearly all the rocks known to us of that age were marine rocks. Prof. D. was not hopeless of the eozoic period even. We have as yet no plants there; but we have found carbon. We have found plumbago; and even in later formations the remains of plants have sometimes been converted into blacklead in the eozoic strata, occurring in beds, so as much to resemble the remains of plants. They have been sea plants. If they were land plants we may guess what they were—anophytes and thallophytes, gigantic mosses and gigantic lichens. If we were to walk among those ancient forests of mosses, if they really did exist, we should be in a world something like what this would appear to an insect creeping upon the mosses of our woods.

I have given you but a faint outline of a great subject, on which treatises might be and have been written, which would afford the material for a course of lectures more interesting than a single one can possibly be. The chief interest of the subject, no doubt, is to the botanist and geologist. The vegetable kingdom now is most beautiful and most varied, especially when we look at it as presenting forms of plants adapted to every climate and every situation upon earth, all of them finding their proper place and their own due season. But the subject before us carries us back into geologic times, and shows us a plan too large to be realized on one earth.

The plan of the Creator was so vast that the whole surface of the earth was not big enough to hold it. It required a series of earths, one after the other, to develop it, just as it has required a series of ages to develop the history of the human race. We have in these old plants something that adds enormously to the variety of the vegetable kingdom; something that shows us how small is our own knowledge, and how great and capable of extension is the plan of the vegetable kingdom. And when we consider further that we know of these fossil plants only what their remains have taught us, it affords a widening field of wonder and of thought. As it is more interesting to the botanist to go out and collect plants for himself, than to study them in the class books, so this subject is of the deepest interest to those who will examine the primeval flora and the coal formations; who will split open the rocks and see the forms that no one ever saw before, and perhaps make discoveries of facts which the world never knew bofore concerning that remote period of time. I must plead guilty as a fossil botanist—I mean a botanist studying fossils [laughter]—to having the deepest interest in this subject. And it arises in part from the very fact that different names are sometimes given to the same plant—as the tree is called sigillaria, the root stigmaria, and the nut still another name; and it requires much observation and study to discover that these different names all belong to what was really one and the same plant. As our knowledge increases we may be able to dispense with many of these old names, which is more than can be said of modern botany.

What would we have done without these old plants, without this great provision made for us in primitive times before man existed upon the earth? These plants form a part of the same plan to which we belong, and undoubtedly that plan existed at the time these old paleozoic plants grew.

And now, I may say, even in this Christmas time, as we gather around the hearth, although our coal fire does not burn, and crackle and blaze like the old yew log of our ancestors, yet the trunks of

our old sigillaria, burning upon our hearths tonight, send forth a quiet, kindly look, befitting their great age and long buried in the earth. And the happy hearts that gather around the Christmas fireside may thank God that we have had these great stores prepared for us in the times of old, and that we have hearts and minds fitted to enter somewhat into that great plan which stored them up, and for the enjoyment in a measure, even of the beauty of the plants that lived so long ago.—*Reported for the Scientific American.*

The First Spring Flower.

Different writers have named different wild flowers as first to appear in the Northern states. John Burroughs says that the hepatica is the earliest, and Bryant, in one of his poems has immortalized the yellow violet, *Viola rotundifolia*, as first, while other writers have given the honor to the beautiful little trailing arbutus—New England's own Mayflower. All of course exclude the skunk-cabbage, and such blossoms as the pussy-willows and the hazel and silver-maple blooms, which are not in the general acceptance of the term, true "wild flowers."

In the latitude of southern New Hampshire, where all my botanizing has been done, the Mayflower is certainly the earliest beginning to show its blooms the first of April (I have gathered flowers the 9th of the month) and lasting until the middle of May, and some seasons I have found flowers in cool, shady woods as late as June. Farther south it appears earlier, and Bryant in writing of southern New England in his poem "The Twenty-seventh of March" speaks of "tufts of ground laurel" which is another very pretty and expressive name for the flower.

Its generic name, *Epigæa*, is composed of two Greek words signifying "upon" and "earth" describing the habit of trailing along the ground. Its specific name, *repeus*, also refers to the same characteristic. Trailing arbutus, its commonest name, was probably applied to it from some resemblance to the arbutus tree, a tropical member of the Heath family to this also belongs. As I have already said, ground laurel is a name by which it is known in some parts of the country, and surely the "crown of laurel" bestowed on the victor in the ancient games of Appollo was no more beautiful than is a garland of the tufts and stems of this, our loved herald of the flower procession. But of all our names for it none is so dear as Mayflower, although April-flower might be more appropriate to its time of blooming.

"How thrilled thy smile when on the rockbound coast
The wearied Pilgrims found thee blossoming."

Yes, ever since the first *Mayflowers* were plucked by our forefathers at Plymouth, we have known and loved it by that name—the most beautiful, the most expressive of them all.

Its habitat cannot be set down with surety, except that it seems to delight in a sandy soil beneath the shade of pines. But one may look for it there and look in vain, for it cannot be depended upon, appearing as it does, now in open fields and pastures, and then in dark cool woods, now on the sandy hilltop, and again on the very edge of the meadow bog. Throughout its range may be found large areas, even whole townships, where it does not grow at all, while in other regions it is very abundant, growing in all sorts of places, woods, fields, pastures, and roadsides occupying all available space.

None of our flowers have been noticed so much by our poets, and none is so universally loved as this. Perhaps its earliness may be responsible, in part, for its popularity, but I am inclined to believe that its delicate, retiring, faintly pink-tined flowers, and its soothing perfune would make it a general favorite, whether it opened its eyes in the sunny springtime, the balmy summer, or the hazy autumn.

C. H. Chesley,
South Barrington, N. H.

An Intelligent Parrot.

The following parrot yarn is going the rounds, which if only true, would add new testimony to Polly's intelligence:

A man whose niece had coaxed him to buy a parrot succeeded in getting a bird that was warranted a good talker. He brought it home, and, after putting it in a cage, stood before it and said: "Say uncle, Polly!" The bird did not respond and after repeating it a dozen times or more with no better success, the uncle put his hand into the cage and, grabbing the bird by the neck, shook him until his head wabbled around, all the time yelling to him: "Say uncle, goll darn you, say uncle!" The bird looked limp and lifeless, and disgusted with his purchase the old fellow took the parrot out into the yard where he had a coop of thirty chickens. Thrusting the half dead bird in with the chickens, he exclaimed: "There, by gosh! You'll say uncle before you get out!" The next morning the uncle went out to see how the parrot was getting on. Looking into the coop he counted twenty-nine dead chickens, and in the centre of the coop stood the parrot on one foot, holding the thirtieth chicken by the neck, and shaking it till its head wabbled, and screaming: "Say uncle, goll darn yer, say uncle!"

The Mineral Production of Canada.

Dr. Dawson, Director of the Geological Survey of Canada, has completed his annual statement of the values of the mineral productions of Canada for 1895. The total value of the production as closely as could be arrived at, was $22,500,000, or an increase of $1,700,000 over that of 1894. From 1886 to 1893 the respective value of each year was:—1886, $12,000,000; 1887, $12,500,000; 1888. $13,500,000; 1889, $14,500,000; 1890, $18,000,000; 1891, $20,000,000; 1892, $19,500,000; 1893, $19,250,000.

*** A very interesting collection of ore has been received at the Geological Survey by Dr. Dawson, Director. It is a sample of auriferous ore from Johannesburg, having been taken from the Ferriera mine at that place. The ore differs from all other that is worked for gold and will be of special value to the geologists in their survey for the purpose of comparison. It is a conglomerate formation highly solidified.

J. W. Miller,
Rimouski, Que.

The Nebraska City Naturalists' Association announce a course of lectures on the natural sciences. The faculty of the University of Nebraska and surrounding states will furnish the speakers. These lectures will be practically free and are not only for the benefit of the Association but all who may desire to attend. The first lecture will be given shortly by Prof. Erwin H. Barbour of the Nebraska University.

Natural Science News.

ADVERTISING RATES.

Only 5c per nonpareil line, each insertion. 12 lines per inch

Nothing inserted for less than 25 cents

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires

100 lines	4½c per line
200 "	4 "
300 "	3½ "
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1000 "	2½ "
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A column contains 120 lines; a page 360

A little two-line ad would use 104 lines during the year, entitling the purchaser to the 4½ cent rate, and cost only 9 cents per issue.

A small one inch ad. run one year would use 624 lines and would entitle the purchaser to the 3 cents per line rate, and cost only 18 cents per issue.

A 3½ inch ad run one year would use 2184 lines and would entitle the purchaser to the 2½ cent rate, and cost only 78 cents per issue.

It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of the working Naturalists almost as soon as it done by addressing each by letter while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

You Havn't an Idea

By seeing any other Geodes from any where else of the unique beauty of this new find of white CHALCEDONY GEODES on the Cheyenne River, S. D. Inside are sparkling crystals of pure quartz selenite, microscopic, loose, perfect rhombs of calcite, milky, frost like, snow ball forms, or lavendar tinted;—7 kinds, all postpaid, for $1 75. Opened in halves and closed up and tied for you. Good size. Single Geodes, 15, 20, 25, 35, 40, 50. Nothing equal to them found in the world in my eleven years in the trade. Tons of fine MINERALS in stock for collectors and schools. ARROW HEADS sent on selection on catalogue terms. White River and Pierre Groups of FOSSILS. INDIAN RELICS of every sort 200 subjects INDIAN PHOTOS. Stereo Views of ALASKA and YELLOWSTONE PARK scenery. Catalogue for stamp.

L. W. STILWELL,

Deadwood, S. D

Better Than a Shot Gun!

A Rare Chance

to obtain a high-grade Opera or FIELD GLASS at a very low price.

The entire stock of Queen & Co., Inc., being offered at great reductions, including some special forms for Naturalists.

Send for circular No. 481 giving full descriptions and prices.

J. G. GRAY, Assignee for

QUEEN & CO., Inc.,

1010 Chestnut St., PHILADELPHIA.

R-I-P-A-N-S

ONE GIVES RELIEF.

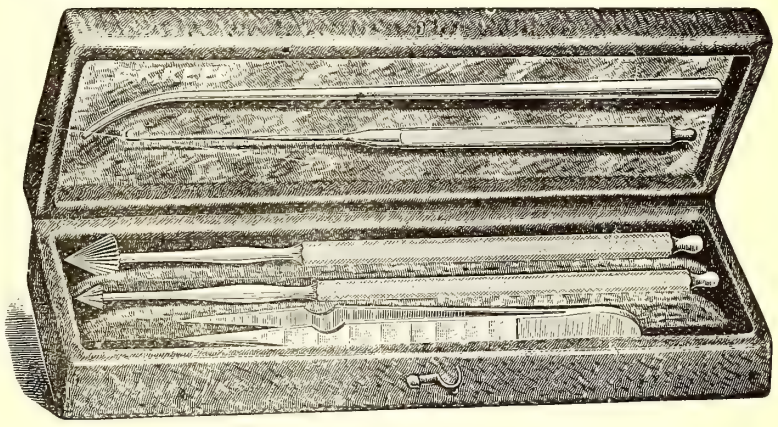
EGG TOOLS! EGG TOOLS!

THE VERY BEST THAT CAN BE MADE.

Set A contains blowpipe (white metal) a large and small wire drill, 5 datas, only 20c postpaid.

Set No. 1.—Nice blowpipe, drill (machine fine cut) embryo hook, engraved handle, all in pocket case, for 35c postpaid.

Set No 2 (See cut.) Contains No's 1 and 4 drills, embryo hook, blowpipe, pointed forceps, nickel plated, in plush lined pocket case, 10 datas, 5 A. O. U. check lists, note book and pencil All of the best, $2.00 postpaid.



CHAS K. REED, TAXIDERMIST.

And Dealer in all Naturalists' Supplies, Minerals, Shells, etc.,

262 Main St., WORCESTER, MASS.

Grand Public Offer.

GIBBS'S PROCESS OF MOUNTING.

Nine Years before the Public, and growing more Popular each season. Hundreds of testimonials from the Atlantic to the Pacific.

Taxidermy at home and self taught. Learn to do your own work and find an increased pleasure in preserving specimens and in decorating your houses and den. Any one can learn it, and a child can comprehend it at the first attempt. If you do not care to try it, get the Process for your children, wife or mother. This Process is a joy in any household and will please all who follow it.

In order to get my method before the public, and in every part of the U. S. the following offer is made

If you will agree to mount a bird by my Process and set the specimen on the peak of the roof of a house or other building, or on the limb of a tree, and exposed to wind and rain, I will send you full instructions, and one pound of prepared Compound, enough to preserve 50 small birds the size of a Quail, together with directions to dress and prepare skins with the hair on for rugs, robes and hangings:—All for

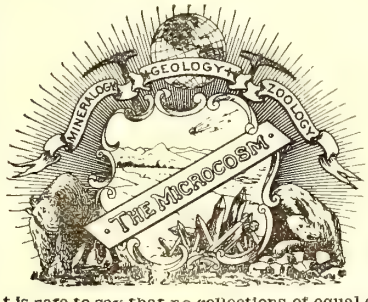
50 CENTS

The mounted specimen exposed on roof or tree, will last forever, and be an advertisement for my Process and will secure you applicants who wish to learn this Art, and you can make money as an instructor, as many are now doing.

This offer holds good until May 15, 1896.

Enclose stamps or money order; mention this paper and address

MORRIS GIBBS, M. D., Kalamazoo, Mich.



Relief Maps,

Systematic Collections,

FOR SCHOOLS OF ALL GRADES.

LANTERN SLIDES, ETC.

Washington School Collections.

Minerals, Rocks and Invertebrate Animals

It is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C

MINERALS

Scientific and Medical Books.

Removal Sale!

Liberal Discounts during the Month of March, 1896.

Owing to the termination of the lease on our present store (in which there are over fifty rooms filled with Minerals and Books) and the necessity of reducing our immense stock before removing to a smaller building in the central part of the city, we have decided to offer the following liberal discounts during the month of **March, 1896.**

15 per cent on all Cash purchases of Minerals or Second-hand Books under $50.
20 per cent. on purchases of $50 and upwards
25 per cent. on purchases of $100 and upwards.
33 1-3 per cent on purchases of $300 and upwards.

Our Stock of Minerals has long been known as the largest, most varied and valuable in the world, and now more than ever before is it replete in thousands of rare and beautiful specimens. With recent wholesale reductions on much of our stock this offer of heavy discounts presents an opportunity that no collector can afford to let pass

Complete catalogue of collections, together with descriptive list of additions to stock, recent discoveries, etc., sent FREE on application.

OUR STOCK OF NEW AND SECOND-HAND SCIENTIFIC BOOKS

is unmatched in any store in America. The prices are uniformly low. The condition of any book we sell is always as represented—otherwise you return the book and we refund the money.

LISTS OF BOOKS referring to *Special Subjects* will be furnished gratis on application. In these descriptions and prices are given. Please mention subject in which you are interested. They inlude Geology, Mineralogy, Chemistry, Physics, Electricity, Agriculture, Horticulture, Botany, Microscopy, Astronomy, Conchology, Entomology, Ornithology, Ethnology, Zoology, Education, and ALL MEDICAL SUBJECTS.

No discounts will be allowed on orders received later than the 31st of March.

A Few

Among Thousands of Books that we have for Sale are the following:

☛ Complete list furnished on application.

AGASSIZ—Essay on Classification, 380pp., 8vo., 1859....$1 50
ABERCROMBY—Seas and Skies in many latitudes, 463pp., maps and illustrations, 1888.... 2 50
BRUYSSEL—Population of an Old Pear Tree or Stories of Insect Life, 229pp., ills., 1870.... 1 25
DANA—Coral and Coral Islands, 398pp, ills. col. plate, 1872.... 2 00
DIXON—Rural Bird Life, 1880.... 75
DOLLEY—Technology of Bacteria Investigation, 275pp, 1891.... 1 00
EMERTON—Spiders, their Structure and Habits, 118pp, 67 ills., 1890. 1 00
FARLOW—Marine Algæ.... 1 60
FLINT—Grasses and Forage Plants.... 1 00
FRENCH—Butterflies of Eastern U. S, 402pp,93 ills., 1886 1 25
FOSTER The Scientific Angler, 300pp.... 1 00
HALL—Problems of Human Life, Here and Hereafter, 524pp, 1880.... 1 00
HIBBARD—Field Flowers, 8 col. plates, London, 1870.... 75
HOWES—Atlas of Prac. Elem. Biology, 116pp, 24 large plates, 1885.... 2 50
KINGSLEY - The Naturalists Assistant, 1892.... 75
KIRBY- Stories about Birds, 256pp., many ills., (back rubled).... 1 00
LEFFINGWELL—Wild Fowl Shooting, 373pp, ills., 1888. 1 00
MARSH—Section-cutting Preparation of Sections for the Microscope, 1879.... 40
PHIN—How to Use the Microscope, 1890.... 25
RECLUS—The Earth Phenomena of the Life of the Globe, 573pp, 234 ills, 1872.... 3 00
REED—Evolution versus Involution, 273pp., 1885.... 1 00
SHEILDS—The Final Philosophy, 609pp, 1877.... 1 00
STEELE—Canoe and Camera, 200 mile tour in Maine, 139pp., ills, 1882.... 1 00
SYMONDS—Records of the Rocks, 433pp., ills., 1872.... 1 50
TREES, Plants and Flowers, When and How they Grow, 140pp, ills, 1870.... 40
TYNDAL—Fragments of Science, 422pp, ills, 1871.... 1 00
WILLIAMS—Science in Short Chapters, 308pp., 1882.... 75
WILSON—Uses and Beauties of Trees, 196pp, 1889.... 40
WOOD—Insects at Home, 670pp, 20 plates, 700 ills. upward, 1872.... 3 00
WRIGHT—Principia or Banis of Social Science, 524pp., 1875.... 1 00

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NATURAL SCIENCE NEWS

VOL. II. No. 9. ALBION, N. Y., MARCH 28, 1896. Whole No. 61.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants." "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

OPALS:--I will send a fine Australian or Hungarian opal to anyone sending me 27 cents in stamps or 25 cents U. S. silver, minted before 18-2. Can be returned if not satisfactory ROBERT BURNHAM, 15 Chestnut St., Providence, R. I.

FOR EVERY 20c sent me before April 20th I will send you 85c worth of fine foreign stamps. For every 50c I will send you $2.50, catalogue value. ERNEST H SHORT, Albion, N. Y. O

DATAS:—We have datas. The finest out. All kinds, egg datas, skin datas, labels, etc. To anyone answering this ad. we will send postpaid our No. 2 Standard egg data, size 3¼x 5½ in. on tough bond paper, with your name and address printed thereon; 100 for thirty cents, 1000 for $2 25, samples free. We can make you good terms on datas printed to your order. THOS. H. BLODGETT, Galesburg, Ill. O

BOTANICAL:—Parties wanting herbarium specimens of California plants will please correspond with me and obtain particulars as to names of plants collected, prices, etc. L. JARED, Estrella, Cal.

MATTESON & MATTESON, Turner, Org., Pheasant breeders. Birds or eggs sent safely to any part of America. The Chinese Ring-neck a specialty. 61-2t

WINCHESTER RIFLE, 38-55 calibre, single shot, reloading tools. Want Coues' Key or Ridgway's or cash. Write. GEO. W. GELMAN, 1041 Windsor St., Reading, Pa.

SWEATER:—A navy blue, turtle neck sweater, hand woven, Australian wool, large cape collar, double front. Cost $6.00 first of March, for $3.75. A. WELLS KIRKPATRICK, 212 Ashmont St., Boston. Mass.

BOOKS:—Scientific, educational, standard and travel to exchange for specimens or cash. W. HARVEY McNAIRN, 4 Harvard Ave., Toronto, Can.

EGGS:—Oregon taken, first-class. I will sell or trade for books on ornithology or a shot gun (breech loading). All my duplicate sets. Write for list with stamp. S. REY STRYKER, Milwaukee, Oregon. 61-2t O

SPECIAL ATTENTION:—One lot of southern Iowa bird skins, 500, for sale cheap, 135 species. Write for particulars. WALTER G. SAVAGE, Hillsboro, Iowa.

200 SPECIMENS from Flint Ridge, illustrating evolution of implements from first to complete stages, by express $1, arrows, discs, spears, turtle-backs, knives, finished and unfinished W. K. MOOREHEAD, O. S. Univ., Columbus, O.

FOR SALE or EXCHANGE.—English setter bitch, one year old. Want kodak, Natural History specimens and books, fishing tackle, or collecting gun. Make me an offer. GEORGE W. BROWN, Box 262, Ypsilanti, Mich. 61-2t

A COLLECTION of about 425 first class single eggs (some with data) for sale. Many rare ones. List furnished. All who mean business write to J. K. AUMACK, Lock Box 907, Ballston Spa, N. Y.

MEXICAN WATCHMAN'S WHISTLE:—Made of clay, new, a great novelty and curio, a regular ear-splitter. Just the thing and very appropriate for a collector's whistle. Prices prepaid, each 15 cts.; 2 for 25c; 5 for 50c; 12 for $1.00; 100 for $6.00. FRANK H. LATTIN, Albion, N. Y.

DEAR SIR:—I am anxious to have you see a collection of the Famous Herkimer County Crystals, hence I make you this offer: If you are a subscriber to this paper, let me send you by return mail, post-paid, 36 of these Brilliant Gems; if they please you send me 72 cents, if not satisfactory return the collection and it will be O K. Yours respectfully, A. B. CRIM, Middleville, Herkimer Co., N. Y.

"PLAIN HOME TALK and Medieal Common Sense," Foote. A Standard Family Medical Book, nearly 1000 pages, new, cost $3.25. Will exchange for desirable sets or specimens. What offers? FRANK H. LATTIN, Albion, N. Y.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, 15 Chestnut St., Providence, R. I. 51-25t

POSTAGE STAMPS bought and sold. Good U. S. and Departments 25 per cent. discount; Foreign 40, 50, and 60 per cent. discount according to quality. Cash with order or satisfactory reference. LOUIS H. PALMER & BRO., Oak Park, Ills. 58-4t

RESURRECTION PLANTS:—Have just received a new stock of this wonderful plant, all A No. 1, the regular 25c grade; but while they last will sell at 15c each; 2 for 2 c; 5 for 50c; 12 for $1.00; 100 for $6.00. *Prepaid* at these prices. FRANK H. LATTIN, Albion, N Y.

"NATURAL SCIENCE NEWS," Vol. I complete. Less than ten complete vols. left, Will send you one for only $1.00. Complete your files. Will furnish Nos. 1 and 2 at 10c each. All others 5c each or in lots of five or more 4c each, or ten or more 2c each. (Nos. 1 and 2 are always 10c per copy net.) FRANK H. LATTIN, Albion. N. Y.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline. Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. t

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612. 17th St. N.W., Washington, D.C.

THOSE WANTING Chinese Ring-neck Pheasants (birds or eggs), deer, bear, or other Oregon birds or animals should address, MATTESON & MATTESON, Pheasant Breeders, Turner. Oregon. 59-6t.

BOOKS. I want good clean second-hand copies of any Book which I offer for sale in my new (May issue) NATURALIST'S BULLETIN. Look over your old Books and send me a list of the ones you will "swap," stating lowest exchange price and what you can use for the same. FRANK H. LATTIN, Albion, N. Y.

CABINETS. Send 10 cts for photo of our speciality—Self Locking. Tperches—Oak samples by mail 8c, 10c and 15c; also stands, shields, glass cases, game panels, &c. Cabinets to order. HANAFORD CABINET CO., 139 and 141 W. Fulton St., Grand Rapids, Mich. 58MOtf

PORTRAIT OF ST. PAUL, photographed from a medallion found in the ruins of Herculaneum. Price 25c, or sent free for 4c postage and distributing 100 circulars. S. SWAINE, Rochester, New Hampshire. 60-2t

EXCHANGE.—First class specimens, all sizes, of Fossil Coral (*Columnain Alerolata*), to exchange for Indian relics, stamps, &c. Write first. GEORGE COULTER, Golden City, Mo.

FOR SALE.—A good full plumaged Bald Eagle, freshly skinned, in fine condition. $10. Send for list of northern birds. OLIVER SPANNER & CO., 358 Yonge St., Toronto Can.

OOLOGISTS WANTED:—I will give 25 cts. each in exchange (selections to be made from Premium List Supplement) for any of the following issues of the OOLOGIST in good condition: July-Aug., 1886; Jan.-Feb., 1887 or Dec., 1886 with same attached: Apr., 1889. FRANK H. LATTIN, Albion, N. Y

"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c: July-Aug., 1886, 15c; Jan.-Feb, 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete*, *clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

A Good Potato is "King of the Roses,"

And I will deliver a whole flour barrel full of them, f.o.b., Albion, N. Y., for only $1.25. When ordering state whether you prefer No. 1 (Merchantable) or No. 2 ("hen's egg") size. Many prefer No. 2 for planting.

If you want the potatoes and prefer to exchange eggs in sets or other specimens, or any of the books, as per my list of wants in NATURAL SCIENCE NEWS of Feb. 29th, write me, I think we can arrange a swap."

One of the largest potato growers of Western N. Y. speaks of the "King of the Roses" as follows: "We thoroughly tested this new seedling on many different soils, and found it to withstand sudden wide changes of weather, excessive moisture and extreme drouth, remarkably well. It produces much heavier crops of fine, large, handsome tubers of excellent quality, than any other of the true Rose family, ripening with Early Rose. It is a strong, rapid grower, standing up well during season of cultivation and when fully developed the vines cover the ground almost completely, and so protect it from the hot sun. Tubers large, oval-oblong, light pink like Early Rose."

I have only a few barrels to spare, and the above price and offer is for April only.

FRANK H. LATTIN, Albion, N. Y.

RARE OLD BOOKS We have in stock or can furnish on short notice books, magazine articles and information on any subject desired. 'Out-of-print' books a specialty. Literary Light $1 a year; sample copy 10cts. Raymer's Old Book Store, 243 4th Ave. S., Minneapolis, Minn.

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M	A.M.	A.M.	P.M.	P.M	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7 00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12.22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9.06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:50
Niagara Falls.		6.35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion..... ....6:50		8:15		1:00	3:25	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9:00

Send 15c stamps and you will receive my new **Normal Catalogue** of all European palæarctic bird eggs, in over 600 numbers, with prices and number of sets for each species. Send $5 bill by registered letter and you will receive, by return steamer, a fine collection of **European Birds Eggs**, including *Falco tinnunculus*, etc., etc.

HERMANN ROLLE,
INSTITUTION FOR NATURAL HISTORY
Emdener-Str. 4, Berlin, N. W., Germany.

Come to Florida.

A fortune can be made in a few years in pineapples and tomatoes; vegetables raised the whole year. An ideal home. For particulars write **R. P. Osler,** Avon Park, Fla. 29&Otf

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

117 Clifton Street, Rochester, N. Y.

BARGAINS IN Showy Shells!

I have recently secured a fine lot of the following which I can offer at the following low prices:

Purple Sea Snail, beautiful and extra large, regular price 40c	$ 20
Spiral Shell, fine	05
Heart or Cockle Shell, both halves complete, reg. price 35.....	22
Razor Shells, small.....	05
Spotted Cassis, fine, reg. pr. 30c...	16
Quoit Shells, both valves.....	06
Giant Scallop	09
" " decorated.....	20
More of those fine Oil Paintings in frame of Venetian Pearl Shell...	30

Satisfaction guaranteed.

ERNEST H. SHORT,
Albion, N. Y.

MINERALS SHELLS, etc. The White City Collections. 50 fine cabinet specimens, $3. 50 smaller size, $2. 50 amateur size, $1. Printed name and locality with each specimen. 50 Shells, Corals, and Marine Specimens, only $3. 100 Fossils, including fine Fish, Trilobite, Crinoids, Corals, Sponges, several fine Ferns, etc., only $8. A great variety Unios with one valve highly published from 35c to $1, very showy. Taxidermy in all its branches at reasonable prices. Illustrated catalogue by mail, 10c. J.M.WIERS, Naturalists Agency, 357 W. VanBuren St., Chicago, Ill.

When answering advertisements always mention the NATURALSCIENCE NEWS.

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Natural Science News.

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My Boyhood Days in Spring.

DR. MORRIS GIBBS.

How oft' in boyhood's days, in years long pas'd,
When chilling winds fled from the vernal sun,
And birds from southern haunts returning fast,
Proclaimed that dreary winter then was gone—
That I, a youth of that ecstatic hour
When Nature opens first to youthful view;
Turning us by a simple bird or flower
From indoor ways to fields and pastures new:
Then walked in boundless freedom, wood and plain
And gathered Nature's wonders from the lea,
With feelings touched by happiness and pain;
Of thoughts of past and of futurity.

Each bird was then a wonder to my eyes,
Each brook melodiously babbled a new found joy,
The leafy tree which in the zephyrs sighs;
All! all, were rapturous to me when a boy.
Watching; wondering, with keen int'rest bent
On learning of the mysteries of the wood,
Unconsciously my spirit underwent
A change, akin to happy solitude.
Farmore to me than ways of city strife,
And deeper in my heart than schools and books,
Were pleasures of the days of that new life
Spent musingly in fields and forest nooks.

Oh, gentle Spring! with zephyrs soft and low—
Wafted o'er beds of fairest woodland flowers;
Where birds of silvery tongue are floating through
The ever pleasing leafy, fairy bowers.
Charmed season of the year, of flower and song;
Season of merry-heartedness and love;
When fleecy clouds through azure drift along,
And poets to woo their muse then seek the grove.
The muse, who by her soulful, innate power
Oft' favors rarest thoughts, all evil spurns;
A gift of Heaven's highest, richest dower,
And from our baser thoughts our fancy turns.

Alone in contemplation most profound,
I walked by river's brim, nor cared for friend
To lure me from my thoughts, while all around
The voices of the wood with sweetness blend.
The bell-toned notes, as pure and fair
As ever Philomela strained, are heard
From wood thrush, shy, secluded bird, the air
Above is filled from the throats of warblers poured.
The winter wren, diminutive proof of song
Concealed, is caroling in bold disdain
Rivaling the gushing grosbeak's notes,
Accompaning the vireo's refrain.

Again in fancy I visit darken'd woods
At early morn and see the squirrels run
About the trunks, and watch their varying moods
Of frolic; the birds of day have just begun
To twitter, and still the owl looks for his prey;
The bat wheels fast o'erhead in freshened air;
O wave of light heralds the approach of day
And active life returns with eastern glare.
The birds burst forth in chorus rich and rare!
The hum of many insects on the wing
Is heard as from the opening flowers they share.
Boy, birds and all are joyous in the spring.

The New York Botanical Garden.

With the opening of spring, work will be prosecuted on the New York Botanical Garden, whose managers propose to make it one of the finest places of the kind in the world. The plans of the garden have been formulated by Cornelius Vanderbilt, president of the garden, President Seth Low of Columbia College, William E. Dodge, Addison Brown and Prof. N. L. Britton, and preparations to carry these into effect have been completed. It is expected that by the end of the warm weather great advances will have been made toward beautifying the region set apart for the garden.

The garden will comprise 250 acres appropriated from Bronx Park, near the Bedford Park station of the Harlem Railroad. The land abounds in natural beauties, which will, of course, be preserved.

A building with three stories and a basement, and having a total floor space of 90,000 square feet, is to be erected near the entrance to the garden for use as a museum. It will also contain rooms for a library, an economic museum, herbaria, laboratories and also apartments where students may study special subjects.

An immense horticultural house of iron and glass, covering an acre of ground, will be another feature of the garden. A central dome 60 feet high will cover the palm house, and smaller buildings of similar construction will be erected for nurseries and rain shelters.

The trustees of Columbia University have agreed to deposit its herbarium and botanical library in the museum building and the mycological herbarium of J. B. Ellis, of Newfield, N. J., will also be preserved there. Lectures will be delivered in the museum, and the work of the garden will be published from time to time in pamphlets.

Three miles of stone driveways will be constructed within the garden, and two driveway bridges, besides many foot bridges, will span Bronx. Footpaths will afford access to every part of the garden.

A temporary nursery has been established in the garden, and about 2,500 trees and shrubs are

ready for transplanting. The native flora in the garden will be preserved. The trees will be carefully labeled. Aquatic and bog plants will be cultivated in the Bronx River and on the marsh land in the garden.

The engineers have surveyed the garden and made topographical maps on a scale of 50 feet to the inch, showing every detail of the garden. These will be shown on the evening of March 26, at the reception of the New York Academy of Sciences, in the American Museum of Natural History. It is expected that several years' time will be required before all the plans for the garden can be realized.—*New York Times.*

California Borax Mines.

Though every now and then reports come from the desert of rich finds of gold and silver, yet the greatest industry of Death Valley and the desert is the mining and working of borax. Twenty years ago borax was first discovered in California, west of the Slate range, seventy-eight miles from Mojave, the discover, John W. Searles, forming a company known as the San Bernardino Borax Mining Company, erected works which have been in constant operation ever since.

The borax in the crude state forms a crust over the marsh. This crust is removed, hauled to the works and placed in solution in immense tanks heated by steam. After allowing the solution to settle, it is drawn off into cement vats, where it is allowed to crystallize. This operation is again repeated, when the borax is ready to be sacked and shipped to market. After the removal of the borax from the marsh, crystals of tincal again begin to form, which are worked but once, when they are in a salable condition. In order to facilitate this operation, water from the marsh is pumped into large tanks, in which the tincal forms.

These works are models of mechanical construction, and are the best equipped on the desert. To the uninitiated, borax working is but a repetition of boiling, settling and crystallizing. The fuel used is crude petroleum, which is hauled in huge tanks from Mojave.

The teams used in the transportation of the refined product are curiosities in their way—a wonder to the tenderfoot and a surprise to the teamster. As these wagons are the greatest in existence, carry the heaviest loads and are seen no other place, a description is in order. The hind wheels are seven feet in diameter, front wheels five feet; hubs, eighteen inches in diameter by twenty-two inches in length; tires, six inches wide and an inch thick; steel axles, three and one-half inches in diameter; bed, sixteen feet long, four feet wide and six feet deep. Each wagon weighs about 8,000 pounds and is capable of carrying 20,000 pounds at a load. Two wagons loaded with borax and an oil tank on a third wagon completed the train hauled by the borax team. The team consists of eighteen mules and two hores—twenty animals in all, which are driven by a bell cord, used as a jerk line. A carload (40,000 pounds) of borax is hauled each trip from the works to Mojave, and a tank of oil and two loads are hauled on the return trip.

It takes eight days to make the trip, and in nearly twenty years not a trip has been missed. Stations at which water can be had, and where feed is stored, have been erected for the borax teams to put up. The borax company has done much to assist in the development of the desert, as water is furnished free of charge at all their stations.

From the borax mine, twelve miles from Daggett, wagons of the same style and teams similar in makeup are used by the borax company. Not all the borax of Death Valley and the desert is found in marshes, and all the marshes, while having the same appearance, do not contain borax.

In Furnace Creek canon of the Funeral mountains, and in the Death Valley marsh, borax is found in the shape of cotton balls, while in the San Bernardino Company's march none of these are found. The cotton balls are borate of lime and are scientifically known as urexite. On taking them from the ground they can be pulverized easily, but after exposure to the air they become very dry and hard. They become so hard that it is necessary to put them through a crusher.

For months after the discovery of borax hundreds of prospectors braved the terrors of Death Valley, and many left their bones to bleach in that terrible sinkhole. Borax was searched for in unheard of localities, but it was only known to exist in marshes and beds of old lakes. It was not until the discovery of silver in the Calico mountains that borax was known to exist in deposits or veins. A miner, more curious than his fellows, had a piece of white looking rock assayed, and made the wonderful discovery that hundreds of prospectors had traveled over a vein of boracic acid more valuable than any marsh then known. This was a set-back to all preconceived notions of borax mining, and the supposed-to-be valueless white rock of the Calico mountains became suddenly valuable. This is only another case of where the values at home were overlooked for the much-talked-of treasures of a far-off land. The deposit at Calico is owned by the Pacific Coast Borax Company, and the product is shipped to their works at Alameda for reduction.

Another and larger deposit of the same class was found at Monte Blanco, in a branch of Furnace Creek canon, but its great distance from a railroad made the working of it an impossibility.

In Death Valley are the rotting remnants of two borax works—institutions which promised, for a time, to make their owners rich. With a fall in the price of borax and the establishment of more accessible rivals, abandonment was forced upon the owners. The works north of furnace Creek, which were erected to utilize the product of Winter's discovery, closed in 1888, after a run of five years. The Eagle works, erected at a marsh belonging to a Frenchman named Daunet, have also been closed down for several years.

Throughout all this country, with the exception of Death Valley, may be found the stakes of the railroad surveyor, and several practical routes for a railroad have been found, though none have yet been decided upon. At the time of the discovery of borax in California, the wholesale price was 50 cents a pound. At present (1894) it is worth about 8 cents. Over 20,000 tons are used annually, about one-third of which is produced in the United States.—*Scientific American.*

Dr. H. H. Rusby.—The famous botanical collector, who has done so much for our knowledge of southern botany, has started to explore the Orinoco region.—*Meehan's Monthly for April.*

The Termites or White Ants of Africa.

The scientific traveler, Max Buchner, tells us how we may picture to ourselves the savannas of Central Africa: "First sprinkle a few million brick-red, irregular pyramids of the termite or white ant over a brick-red surface, in the proportion of, at least, five to the hectare. Next take about four times this number of trees, and distribute them so that there shall be twenty, more or less, to the hectare. Then distribute, in like proportion, an equal number of Bushmen. Finally, fill up the intervening spaces with clumbs of high grass, just far enough apart to render visible the red earth between. Do this and you will have a faithful representation of the open African forest, but little influenced by the destructive hand of man."

The presence of these white ant pyramids is the characteristic feature of the African landscape. The builders of these structures are not ants; but belong to the much smaller family of termites. There is scarcely an insect so thoroughly hated by man as the termite, and the hatred is fully justified. "There are regions in Africa," writes a traveler, "of which it is safe to say that if a man with a wooden leg were to lie down to sleep at night, othing of the leg would be visible in the morning save a little sawdust." The termites gnaw away everything; the balconies and posts of the houses, tables, chairs, wardrobes, books, leather, cloth—in fact, little comes amiss to them except iron—though, strange to say, on the authority of Franz Leuschner, they will not touch the European pine and fir timber brought to Africa for building purposes. The evidences of the destructive labors of the termites are to be seen on every side; but the creatures themselves are rarely seen. They steal sneakingly to their labors. They are all blind, with the exception of the king and queen, and all defenseless except the soldier caste, which constitutes about one or two per cent. of the population. To escape starvation they must leave their subterranean homes or pyramids in search of dead wood, and, because of their blindness, they render themselves invisible as the best mode of defense.

If one has an opportunity to observe the insect in his work of destruction, the sight is really a most remarkable one. Here is an opening in the earth. A little head appears in it, with a pellet of clay in the jaws; the pellet is laid down, and soon another head appears with another pellet covered with a vicid salivary secretion, by means of which the pellets are fastened together. In this manner, by incessant toil, a small clay tube is constructed, and prolonged until it strikes against a piece of dead timber, the soldier termites guarding the opening from hostile insects the while. The termites then gnaw their way into the timber, eating or removing the whole inner contents, leaving only a thin outer shell. These tubular passages, made by the termites, are even more wonderful than their pyramids. They are about the diameter of a small gas pipe, and are frequently carried in a zigzag course by the termites up the trunk of a tree in their search for a dry branch. One may travel for hours and not find a single tree without one of these passages.

In spite of their destructive proclivities, the termites perform much useful work. There is a certain neatness in the open park-like scenery of Central Africa which strikes one immediately. It gives one the impression that it is scrupulously swept and cared for, and one asks himself, involuntarily, what good fairy maintains such perfect neatness and order in the wilds? There are indeed, forest keepers of various species, who are continually occupied in the removal of all dead animal matter, from the fallen elephant to the dead fly, and who bury in the purifying earth what they cannot consume. What these do for animal remains, the termite does for the vegetable kingdom. Every trunk, branch, twig or old bark layer the moment it is smitten with death, is attacked by the white ants who subsist on it, and whose numbers are limited only by their means of subsistence. The balance between them and the vegetable kingdom is thus maintained by natural law. If we examine their pyramids, we find that the interior, contains innumerable chambers connected by passages. There are store rooms, breeding rooms and nurseries. The chamber of the queen is near the ground, and frequently below the surface. Each of these settlements may be taken as representing a kingdom whose people are divided into distinctive castes, with division of labor. First there are those engaged in the perpetuation of the species. There is only one queen in each settlement, and she when fertilized, is enlarged to a cylindrical shaped figure, several centimeters long, with nothing in her appearance, except her head, to suggest what she is. She is carefully watched and tended and feed by her subjects, and lays eggs upon eggs, many thousand a day, and that for months continuously. The other casts, are the soldiers, recognizable by their massive heads, and the workers, with the little round heads. The later provide the food and nurse the young, and know how to feed the nymphs, that they can develop a worker into a queen if there is occasion for one, that is, if the reigning queen should die.

The great work of the white ants, analogous to the labor of worms in temperate climates, is to bring np the subsoil clay to the surface, where it sooner or later mingles with the surface soil, and perhaps gets washed away to form new valleys. One must study the works of these little creatures carefully to form an idea of their extent and importance.—*Die Gartenlaube, Leipzig, No. 9; Translated and condensed for the Literary Digest by C. Falkenhorst.*

Dust in Nature.

Without dust there would be no blue firmament; the heaven would be blacker than we see it on moonless nights. On this black background the glowing sun would shine out sharply, and the same sharp contrast of intense light and deep shadow would characterize the surface of the earth. There would be nothing to subdue this sharp contrast but the moon and stars, which would remain visible by day. The illumination of the earth would be similar to that which we observe when looking at the moon through a telescope; for the moon has no atmospheric envelope, and, consequently, no dust in suspension. It is due entirely to the dust that we enjoy our soft, uniformly diffused daylight, for which our eyes are specially adapted; and it is the dust which contributes so much to the beauty of the landscape. But while the foregoing explains how the dust makes the whole vault of heaven light, it does not explain why it is chiefly the blue rays of the white sunlight that are reflected, and only to a small extent the green, yellow and red rays. This is dependent on

the size of the dust particles. It is only the finest of them that are borne by the air currents into every stratum of air, and it only these fine, widely diffused dust particles that are of any significance in this connection. Now, let us consider the mechanism of light and the extreme shortness of the ether waves which constitute its essence. These waves, although all microscopically small, vary considerably in length. The fine atmospheric dust includes many particles large enough to reflect the short blue ether waves, fewer particles capable of reflecting green and yellow, and still fewer large enough to influence the long red ethereal waves. The red light, consequently, passes through the great majority of the dust particles comparatively unhindered; the blue rays on the contrary, are intercepted and diffused, and so become visible. This is the reason that the finest dust—and so, too, the firmament—appears blue.

So, then, the finest dust appears blue. You may observe that the wreath that curls upward from the burning end of a cigar is blue, while the smoke drawn through and exhaled is whitish. The particles in the latter case have united and become large enough to reflect white light. So, too, in the county, on a clear day, the sky is blue; but in the city it appears whitish, because of the greater number of coarse dust particles in the air. It is especially on mountain heights that the sky is so intensely blue, because the rarefied atmosphere supports only the finest dust particles. At great height the sky would be almost black, if there were no dust particles in suspension. We see it grow pale as we turn our eyes to the lower strata of air toward the horizon. But why is the sky in Italy and in the tropics so much deeper blue than with us? Is the dust finer there? As a fact, it really is. Not that finer dust rises there; but in our climate the dust particles are soon saturated with water vapor, which makes them coarser. In warmer regions, however, the vapor retains its watery character and does not condense on the floating dust. It is not until the aerial currents have borne it to higher and colder regions that it is condensed to clouds.

This brings us to the most important role played by dust in our atmosphere: its influence in determining rainfall, due to the fact that vapor fluidifies upon the dust particles. It may be accepted as beyond question that of all the water evaporated by the sun from the surface of land and sea, not one drop returns which has not condensed upon a particle of dust as a nucleus. This is easily demonstrated. We fill a large flask with air which has been filtered through cotton waddings until all the original dust is driven out and the flask is full of dustless air. Into this dustless air turn a current of steam from a kettle and you will find it transparent, and, therefore, invisible. Not a trace of the cloudy appearance we associate with steam. The only thing noticeable is that the inner walls of the flask begin to drip; the vapor condenses here as it cools, because there is nothing else for it to condense on. But blow ordinary dust-laden air into the flask and the vapor at once assumes the familiar cloudy appearance due to its condensation on the dust particles and it begins to rain in the flask. The reason for this is that the vapor condenses on the dust particles and freights them until they sink as rain drops.

Without dust, then, we would have no fog, no clouds, no rain, no snow, no brilliant hued sunsets, no cerulean sky. The surface of the earth itself, the trees, the houses, along with man and beast, would be the only objects on which the vapor could condense, and these would begin to drip whenever the air was cooled sufficiently. In winter everything would be covered with a crust of ice. Our clothes would become saturated with water condensing upon them. Umbrellas would be of no avail. The vapor-laden atmosphere, moreover, would penetrate to our rooms and condense upon the walls and furniture. In short, the world we live in would be quite another world if there were no dust. Since scientists began to realize the important part played by dust in the economy of nature, measures have been taken to count the particles in a given space. In London and in Paris at the surface a cubic centimeter has been found to contain nearly a quarter of a million particles. On the top of the Eiffel Tower there are about half as many, while in the high Alps there are only about two hundred particles to the centimeter. A great deal of the dust at high altitudes is comic dust, consisting like the meteorites, of carbon and iron.—*Die Gartenlaube* (*Leipzig*).

Spain's Big Meteorite.

In our issue of February 22 we called attention to the bursting of a great aerolite over Madrid on February 10. The Spanish newspapers have now reached this country and give full details of the event. This phenomenon is seldom observed on so startling a scale. The sky was cloudless, the streets were just beginning to be thronged with traffic and pedestrians, when the deafening sound of the explosion was heard. Those who happened to be looking at the sky say that the instant of the explosion there was a vivid glare of blinding light and then there instantly appeared at the place where the disturbance originated what looked like a cloud of white and bluish tint, bordered with red, which moved east at a tremendous rate, leaving behind a thin train illumined by the sun that may have been dust particles. The whole city appeared to be shaken as if by an earthquake, and the agitation of the atmosphere was shown by the rapid fall and rise of the barometer. The terror inspired by the occurrence was very great, particularly among the ignorant and superstitious. Many people did not recognize the origin of the phenomenon and thought some terrible catastrophe had occurred. The energy of the disturbance probably equaled that of the explosion of a large powder magazine. Many windows were shattered and walls injured, but fortunately no one was killed. The aerolite was visible over at least three-fourths of Spain as it shot through the air above the peninsula. Some damage was done at places along its route, for the great meteorite partly disintegrated on its way, and the incandescent fragments that showered npon the town of Lograno set two buildings on fire, and at Burgos three free fragmeuts fell among the houses. Other pieces of the stone that were fluug off near Madrid were picked up while still hot.—*Scientific American.*

A large collection of 17,000 stuffed birds and many series of bird skeletons has been bequeathed to the British Museum by the late Mr. Henry Seebohm, the naturalist. It is the most valuable gift made to the natural history section of the museum in a quarter of a century. Its ornithological collection is now the largest in the world, consisting of 300,000 specimens.—*Scientific American.*

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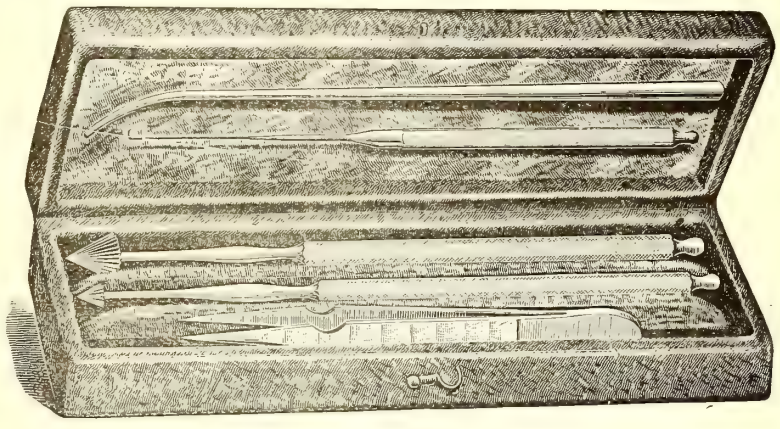

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Purple Sea Fan, *Rhipidogorgia flabellum* 15, 25, 50
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" " 25 " 3 " 45
" " 25 " 4 " 60
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Set, 20 var., unused, French Colonies 40
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4r unused, Guatemala, 1878 10
½r unused, Guatemala, 1879 10
10c Vermillion, unused, New Brunswick, 1860 25
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1c used, British Guiana, 1850 5
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NATURAL SCIENCE NEWS

VOL. II. No. 10. ALBION, N. Y., APRIL 4, 1896. Whole No. 62.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

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DIANA.—*Argynnis (S.) diana* cheap for cash, or exchanged for North American butterflies not found in Virginia. W. ALPHONSO MURRILL, Staunton, Va. (Blacksburg, Va. after June 1). N.

TO EXCHANGE.—I have large lists of fossils, minerals, sets, Indian Relics and finely mounted birds. I will exchange for good sets or skins and good cloth bound books. Send lists and state which lists you desire to select exchange from. GEO. W. DIXON, Watertown, S. D. N.

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"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete, clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

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Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7 00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....6:00		7:25	8:50	12:00	2:25	5:55	6:45
Albion.... ....6:50		8:15		1:00	3:15	6:45	7:50
Rochester.....8:00		9:20		2:05	4:35		9.00

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Correspondence with parties meaning BUSINESS solicited. Address at once,

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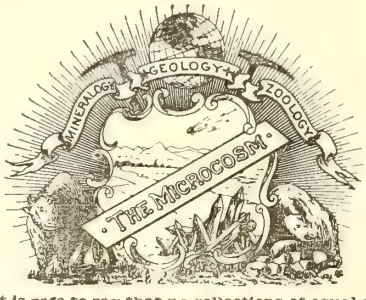

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Natural Science News.

VOL. II. No. 10. ALBION, N. Y., APRIL 4, 1896. Weekly, $1.00 a Year

Natural Science News.

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FRANK H. LATTIN, Editor and Publisher, ALBION, N. Y.

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The Cryolite of Greenland.

The earliest mention of the existence of cryolite that I have been able to obtain is in a mineralogical dictionary published in France in 1809, which says that all the cryolite then known was obtained in small lnmps on the coast of Greenland. It appears, however, to have been afterward forgotten. In 1850, during an exhibition of Eskimo tools and products held in Copenhagen under the auspices of the Danish government, Dr. Gustave A. Hartman noticed a white mineral of which the sinkers for their fish nets were made. He analyzed it, and reported it to be cryolite. The Danish government, in the following year, made investigations and discovered a large bed of the mineral on the west coast of Greenland; in latitude 61 degrees 18 minutes. The bed is equally distant from the small colonies of Julianshaff and Frederickshaff, at Ivigtuk (often erroneously called Ivigtut), on the Arksuk Fiord. This bay is accessible to vessels only dnring the early and later parts of the summer, at other times it is full of either pack ice or bergs.

The shores of the fiord are very mountainous, and vessels in harbor there make fast to the rocky walls by their bow, while at their stern they can get no soundings. Such was the place where, in 1865, Dr. Julius Thomsen opened a mine of cryolite. Nowhere else in the world can it be obtained so cheaply, and in large quantities, for it is only found in two other places, Miask, in the Ural Mountains, and on Pike's Peak, El Paso County, Colorado.

The place where the mineral is now worked is about 12 miles up the fiord from the Danish settlement of Arksuk. It is an open cut, 600 feet long by 200 wide, and may be worked from April to October. The way in which they protect the mine in winter is interesting.

If the mine were left unprotected, the water which runs into it would freeze, as it appeared, and solidify in layers, so that by spring there would be thousands of tons of ice, filling the mine, which would take a whole summer to dislodge. To prevent this, on stopping operations in the fall, they flood the pit with water, which freezes on top to about four feet in depth. Then, in the spring, a hole is punched in the ice, the water pumped out, and the remaining ice is easily disposed of. The mineral is found in solid veins in the granite mountains penetrating upward at an angle of forty-five degrees on one side and down beneath the sea on the other. It occurs in two veins, a central portion, about 500x1,000 ft. in section, and a peripheral bed, surrounding the other, and merging into the granite. The line between the two veins is very sharply defined, though there is in some places an intermediate portion, consisting of the minerals of the outer zone, inclosed in cryolite. The outer vein contains nearly all the minerals, including quartz, feldspar, ivigtite, fluorite. cassiterite, molybdenite, arsenopyrite, columbite, siderite, galenite and chalcopyrite. The central portion consists of cryolite, containing pachnolite, ralstonite, quartz, sphalerite, pyrite, wolframite, arksutite (a variety of chiolite) thomsenolite, gearksutite and hagemannite. Crystallized cryolite occurs in cavities in the mass. In this inner vein, the cryolite is very pure, and increases in purity as the miners descend. At a depth of 100 feet from the surface, whole cargoes have been obtained sampling 99½ per cent pure cryolite. The impurities in the cryolite, which reduce its commercial value, are the siderite, chalcopyrite and galenite. The fluorides, such as pachnolite, are entirely unacted upon by the processes to which the cryolite is subjected.

The entire output of the Ivigtuk mines is sold to the Pennsylvania Salt Manufacturing Co., by the Danish government, while the lead and iron ores are sold to an English firm. The siderite perfectly adapted to use in the recarburizing part of the Bessemer process of making steel.

The name of cryolite oomes from two Greek words, *kryos*, ice, and *lithos*, a stone, because when the Eskimos discovered it they said they found a new kind of ice that did not melt in the summer.

In their works at Natrona, Pa., near Pittsburg, the Pennsylvania Salt Co. make the cryolite into carbonate of soda and alum, both of a purity not easily obtained by other processes. The manufacture of metallic aluminum from cryolite has been tried and proved efficient, but is not carried on to any extent at the present time.

About the time that the contract for the supply of cryolite was concluded by the Pennsylvania Salt Co., a party who was in possession of some small fragments made a series of experiments, to test its usefulness in the manufacture of transparent glass. The experiments were unsuccessful, but resulted in the production of a beautiful specimen of opaque glass resembling French porcelain, and at a cost far below that of any existing process. The recipe consists of the mixing together of powdered cryolite and sand, in the proportion of 1 part cryolite to 2 of sand, with half an equivalent of zinc oxide. The zinc oxide need not be at all pure, and makes the glsss readily fusible, as lead oxide does in the flint glass.

The resulting ware is very hard and tough, so that a vessel of the size of a plate, stamped out of this material with the rapidity with which such articles are made, may be thrown down violently without fear of breaking. The advantages of this material over porcelain are easily seen. Porcelain must go through the tedious and expensive process of mixing and tempering selected clay, moulding on the wheel, drying, baking and annealing, and when finished breaks at sight.

On the other hand, a tea cup, as dainty and beautiful in appearance as china, yet strong as metal, may be made from cryolite as cheaply and rapidly as an ordinary glass

tumbler—*Read by Francis H. Knauff before the Studets' Mineralogical Club, Philadelfihia July 7, 1893.*

Nature's Most Invincible Creatures.

We are apt to consider ourselves the most powerful and all-conquering members of the animal world, and next to us we range such creatures as the lion, tiger, grizzly bear and elephant, as capable of maintaining their own against all comers in an open hand-to-hand or mouth-to-mouth fight. Yet in doing so we err greatly, simply because we consider mere bigness or muscular force, forgetting the energy and the intellectual powers that make one of nature's tiny creatures, when combined in the vast numbers in which they are always found, by far the most formidable animal force known on land. Therefore, when the question is put to us, "Which do you consider the most resistless of all animals?" it is always safe to reply that if warlike manifestations are referred to, the soldier or driver ants are far and away the most terribly invincible creatures with which we can be brought in contact.

Monsieur Coillard, a French missionary in the Barotse Valley of South Central Africa, thus writes of these terrors there: "One sees them busy in innumerable battalions, ranked and disciplined, winding along like a broad black ribbon of watered silk. Whence come they? Where are they going? Nothing can stop them nor can any object change their route. If it is an inanimate object, they turn it aside and pass on; if it is living they assail it venomously, crowding one on top of the other to the attack, while the main army passes on, businesslike and silent. Is the obstacle a trench or a stream of water? Then they form themselves at its edge into a compact mass. Is this a deliberating assembly? Probably, for soon the mass stirs and moves on, crosses the trench or stream, continues in its incessant and mysterious march. A multitude of these soldiers are sacrificed for the common good, and these legions, which know not what it is to be beaten, pass over the corpses of these victims to their destination."

Against these tiny enemies no man, nor band of men, no lion or tiger, nor even a herd of elephants, can do anything but hurriedly get out of the way. Among the Barotse natives a favorite form of capital punishment is to coat the victim with grease and throw him before the advancing army of soldier ants. The quickness with which the poor wretch is dispatched is marvelous when it is considered that each ant can do nothing more than merely tear out a small particle of flesh and carry it off. Yet in a surprisingly short time the writhing victim will have been changed into a skeleton of clean and polished bones that will make the trained anatomist envious.

All are familiar with the tales of how these armies of ants enter a tropical village aud take entire possession of it, driving its inhabitants out in terror, and at last in a few hours or a day or two abandoning it cleaner than the arts of the most orderly housekeeper could ever make it. These are not travelers' tales. The most gifted pen must fail to give an adequate idea to the uninitiated of just how thorough and searching these creatures are in ridding a house of every bit of animal or vegetable matter in it. Perhaps, however, the narration of the following bit of personal experience may help to illustrate it. I had returned from a day's tramp in the hills, laden with trophies in the shape of tropical insects, some of them, perhaps, new to the eyes of scientists, and all of certain value when I was called out of my house by the cry, "The driver ants, the driver ants." Hastily placing most of my collections in glass jars and tin boxes, so as to be out of the reach of the invaders, and gathering such clothes as I would need for a day or two, I made a rather undignified retreat. After I had done so, I remembered that I had left some rare bees pinned in a box that was in the pocket of my collecting coat, but as the coat had been placed in a strong chest and this chest was heavily scented with naphthalin or "tar camphor," and the lid fitted down very tight, I felt that they were safe. The next morning when I went back, after a night spent in my hammock in a tamarind tree, I found that a bunch of bananas, consisting of a thick stem and about 100 of the fruit, there was no trace whatever, save the dangling strings with which it had been hung from the ceiling; and not a vestige of bread, chocolate, coffee and other eatable odds and ends could be found on the thoroughly cleaned shelves on which some food had been left. Even the cracks between the floor boards had been cleaned out, the particles of edible matter having been carried away or devoured and the mere dust left where it could easily be swept away.

This was not so bad, for a good cleaning never hurts a house in the tropics, but when I came to examine my chest and found that a hole quite two inches in diameter had been torn in one end through an inch board of hard wood, that the box in my coat pocket had also been pierced and every one of the pins on which my beetles had been arranged stood in place as empty and clean as when taken out of the paper, I had a better idea of the thoroughness of these tiny scavengers than ever before.—*Dr. Eugene Murray Aaron in Scientific American.*

The Bahama Expedition of the State University of Iowa.

During the summer of 1893 a most unusual move in educational circles was made by the State University of Iowa.

It is well known among scientists that nowhere in the world, possibly, do the waters of the sea throb with a more varied and wonderful marine flora and fauna than around the Bahamas and Florida keys. The "gardens of the sea" are there! With a water-glass (a common wooden bucket with a glass bottom) one looks down through brilliantly hued waters upon scenes of wonder and exquisite beauty.

There are great jagged caves of coral, with curious sponges growing about their walls; long, slender sponges of lilac and ocher, and some of scarlet and others of brown and black, and still others coarse and clumsy, looking like lumps of yellow mud or clay. There the slender gorgonias, ranging through all the shades of browns and tans, lift their delicate fingers teeming with polyp life. Yonder one sees a cavern carpeted with gorgeous "sea anemones," their tentacles glowing with bright green and scarlet and maroon and flesh color. These are Neptune's sea flowers! Here those treasures of the mermaids—the "sea fans"—gracefully wave their red and yellow lacework, and the "sea feathers" toss their nodding plumes. On this jutting coral crag a "sea urchin" bristles in long, slender black spines, and a little further on one

of its relations glistens in a spiny armor as white as ivory. In and out among these caves flash the tropic fishes, on which the sea god has lavished the most vivid colors of his palette—intense blue and silvery white and gold, and turquoise; and some of these dwellers in his secret halls even gleam like mother-of-pearl, with all the colors of the rainbow.

But useless would it be to attempt to appropriately picture forth the wealth and beauty of these hidden wonders.

A few years ago the student got his knowledge of these marine forms from musty text-books bristling with names often as meaningless as unpronounceable. Later he had the advantage of dried and alcoholic specimens. But it was not until very recently that an effort was made to give him an opportunity to study these most beautiful and wonderful forms of life in their native homes.

Prof. C. C. Nutting, of the chair of systematic zoology at Iowa State University, had twice before crossed the rich zoological waters around the Bahamas, and it was then that occurred to him the plan which the summer of 1893 finally saw realized.

The Emily E. Johnson, a two-masted schooner, 96 feet long, tonnage 115 tons, was chartered of its owner, Captain C. C. Paul, of Baltimore, for three months for the use of the "Bahama Expedition of the State University of Iowa," which had for its object the "careful and systematic investigation of the marine fauna and flora around the Florida keys and Bahamas." The schooner was rapidly transformed into a dwelling vessel and floating laboratory.

A huge skylighted hatch was cut in the hold, and the hold itself fitted up to serve at once as sleeping apartments for the gentlemen of the party, as dining room, and as laboratory.

A double tier of extemporized bunks lined either wall, long oil-cloth-covered tables and camp-chairs occupied the center space, and a complete scientific library and laboratory supplies, including microscopes, chemicals, dissecting apparatus, etc., occupied shelves at one end. Provisions were stored in the forepart of the hold.

On deck was placed the hoisting apparatus, which was worked by hand and provided with 300 fathoms of wire rope. There was no steam aboard. The vessel had been chosen for its fitness to ride the shallow waters about the keys and islands.

Charles Flowers, of Baltimore, was engaged as captain and George Merrill was mate. Three sailors, a cook (all as black as the ace of spades), and a saffron-hued mulatto waiting boy comprised the crew.

The party itself was composed of twenty-one members (of which were ladies), and included professors, instructors, alumni, and students of Iowa State University, Professor Nutting being the leader. Gilbert L. Honser, instructor in biology, was the photograper, and many beautiful pictures were taken.

All were interested in science and each was supposed to be especially interested in some particular branch of science. All had applied voluntarily for membership in the party. The university furnished all appliances for dredging, for preserving materials, and for study. In addition, each member paid $200, which covered all expenses incurred by the party *collectively*, including car fare from Iowa City to Baltimore and return, with "stop-offs" at Washington and the World's Fair, in addition to our life aboard the vessel for three months. It is estimated that we traveled by land and sea some 6000 miles.

On May 5, 1893, we left Baltimore in our floating summer home and laboratory.

Seven days later we anchored in the harbor of Egg Island, Bahamas. Here we made a marvelous collection in the shallow waters and on land. Our deck was strewn with sea-fans and gorgonias. There were great tubs of rattling crabs and star fish and sea urchins, and buckets of mollusks. The ornithologist and entomologist had captured strange birds and "bugs," the first prize of the latter being that curious luminous beetle worn by the Cuban ladies as a glowing ornament for the hair or to catch the lace of their mantillas. The botanists had their cans full and running over with tropic vegetation, from the passion flower to our own familiar shepherd's purse and *sand burr;* and there were pans full of floating algae, "sea mosses." But it would take volumes to give an adequate idea of the spoils.

From here we sailed for Havanna, spent a few days exploring the city, and just outside the harbor dredged for that exceedingly rare animal form until lately supposed to be extinct, viz., the *crinoid*, genus *Pentacrinus*. We found fully 150 beautiful and perfect specimens.

Bahia Honda, thirty miles further along the western coast of Cuba, next claimed our attention. The Spanish authorities, however, took us for a filibustering expedition, and forbade us to go more than 30 feet from the water line. The mosquitoes also waged war against us, and we turned toward Key West.

Here, too, however, we were forbidden to land, as a vessel clearing from a Cuban port during the quarantine season must either lie fifteen days at sea or go to the Dry Tortugas and be fumigated.

Accordingly we chose the Dry Tortugas, and made many valuable collections, both by dredging and in shallow waters around the keys. Here we procured our first shark and investigated the coral reefs.

Returning to Key West, we dredged in the vicinity some three weeks. In deep sea dredging we used a common oyster dredge, a trawl, and a tangle bar. This last was especially useful in procuring the finer materials. It was merely a horizontal bar of iron, with great masses of raveled manila hemp rope tied to it, and in its meshes were caught a tangle of basket fish, crabs, sea urchins, deep sea algæ, and so on.

Clearing from Key West, we sailed for Harbor Island, Spanish Wells, and Eleuthera, Bahamas, and after a hasty run to Little San Salvador, or Cat Island, we had to turn northward, as we were due at Baltimore August 1.

The whole summer had been one delightful round of novelty and surprises. To one scientifically inclined it was an opportunity for careful study and investigation, such as has heretofore been enjoyed only by specialists in government employ. The knowledge gained in actually seeing and studying these curious life forms in their native element was of more practical value than the perusal of whole libraries of monographs, or years of study of museum specimens.

Then the trip offered, as well, glimpses of the customs and peoples of strange countries under the rule of three different powers. Cuba is Spanish, Key West and the keys are Uncle Sam's southernmost possessions, and the Bahamas are English. It was a study in comparative sociology. The trip has opened new avenues to educators; new possibilities to students, and to scientists, we feel

safe in saying, it will offer many new life forms, dredged from the "unknown depths."

As the favoring breeze swelled our sails homeward bound and the foam curled, a silvery plume behind our prow, studded at night with glowing phosphorescence, our little group sat silent on the deck, awed, subdued by the splendor of the tropic sunset, the swift-following night, or the indescribable beauty of the moonlight on the sea.

As we sat dumb, in trying to comprehend the infinite expanse of ever-restless water around, the infinite expanse of burnished sky above, the infinite *silence* over all, and as memory wandered back over the revelations of the summer, one and all were humbled with the consciousness of the insignificance of man and the goodness of the Incomprehensible in granting us these glimpses of this wonderful glory!—*B. M. Wilson A. M. in Scientific American.*

State University of Iowa, April, '94.

Origin of the Columbine's Botanical Name.

There are but few persons who are not interested in knowing how plants come by their names, and there has been much speculation in relation to the botanical names *Aquilegia*, given to these plants. Most investigators have concluded, as Dr. Asa Gray expresses it, that "the name is derived from *aquila*, an eagle, from some fancied resemblance of the spurs to talons;" but that it is a very far-fetched fancy is apparent from a glance at the nectaries or spurs in our plate. There is, however, a little more scope for the fancy in the curved nectaries of some of the European species, though very little even there.

But even this does not account for the latter portion of the names, and so some have sought a better explanation in *Aquilegium*, which means a gathering or collection of rain-water, and suppose it was given to this plant because the nectaries are so formed that they might gather or collect rain. But that this conjecture is unsound we may gather from the pronunciation which even from the oldest period that we can trace has been *Aquile-gia*, while the water-gathering supposition would demand *Aquileg-ia*. It seems more than probable that the name is derived from the old story of Ganymedes. Most persons are familiar with the story of the beautiful boy, Jupiter's cup-bearer, who is represented on the back of an eagle flying through the air. Jupiter had a daughter, named *Aquilegia*, who was famed for great beauty, and among her most ardent admirers was the handsome servant of Jupiter, who paid her frequent visits on his celestial bird. It so happened, however, that the maiden was more smitten with the eagle than with its rider, and she gave her heart to the bird. When Ganymedes at length understood the situation, he endeavored to repair matters by hiding the eagle when he came to court the maiden. But this only made matters worse. She pined for that eagle, broke her heart at its continued absence, and died. As was usual in these catastrophes, according to the Grecian stories, Jupiter, grieving for the loss of his favorite daughter, turned her dead body into a flower, and gave it this name after her death,—which means literally that her life was given or bequeathed to the eagle. If this explanation of the origin of the name be correct, it may explain many of the poetical allusions we often meet with in connection with *Aquilegia.—Meehan's Monthly for April.*

How Camphor is Made.

One of the principal products of Formosa which has come under Japanese administration as a result of the war with China is camphor.

Small shanties are scattered over the hills where the camphor trees grow, and in all directions the clearing of the woods is going on at a rapid rate. On the hillsides are built distilleries, consisting of oblong-shaped structures principally of mud bricks, and about ten or twelve feet long, six feet broad and four feet high.

On each side there are five to ten fire holes about a foot apart and the same distance above the ground. On each fire hole is placed an earthen pot full of water, and above it a cylindrical tube, about a foot in diameter and two feet high, passes up through the structure and appears above it.

The tube is capped by a large inverted jar, with a packing of damp hemp between the jar and the cylinder to prevent the escape of steam. The cylinder is filled with chips of wood about the size of the little finger, which rests on a perforated lid covering the jar of water, so that when the steam rises it passes up to the inverted jar or condenser, absorbing certain resinous matter from the wood on its way.

While distillation is going on an essential oil is produced and is found mixed with the water on the inside of the jar. When the jar is removed, the beady drops solidify, crystalization commences and camphor in a crude form, looking like newly-formed snow, is detached by the hands, placed in baskets lined with plantain leaves and hurried off to the nearest border town for sale.

With regard to camphor, as in other commercial matters. the Chinese government has acted very foolishly. For over 30 years there has been a constant demand for camphor, and yet the administration has done nothing to prevent the reckless waste of the forests and taken no steps to provide for the reafforestation of uninhabited tracts useless for cultivation.—*Scottish Geographical Magazine.*

The Marvels of an Ostrich's Stomach.

The post mortem examination of one of the flock of ostriches owned by Barnum & Bailey, which has been on exhibition at the Central Park menagerie, New York City, gave the spectators a wonderful object lesson of the digestive capabilities of an ostrich. The ostrich was dissected by a taxidermist. He found the following articles in the bird's stomach: One wooden clothes pin; the bottoms of two beer bottles; a mouth harmonica, five inches long and two inches wide; a ferrule of an umbrella with a piece of the stick in it about four inches long; a metal skate key; a brass door key, five inches long; a woman's black horn comb; two pieces of coal; a woman's silk handkerchief; three stones about an inch thick, together with some cabbage, grass, lettuce, celery and considerable dirt. Strange to say, the ostrich did not die of indigestion, but from tuberculosis. The bird will be mounted in the museum and it would be interesting to preserve alongside the collection of objects which was found in its stomach.—*Scientific American.*

Continued from last page.

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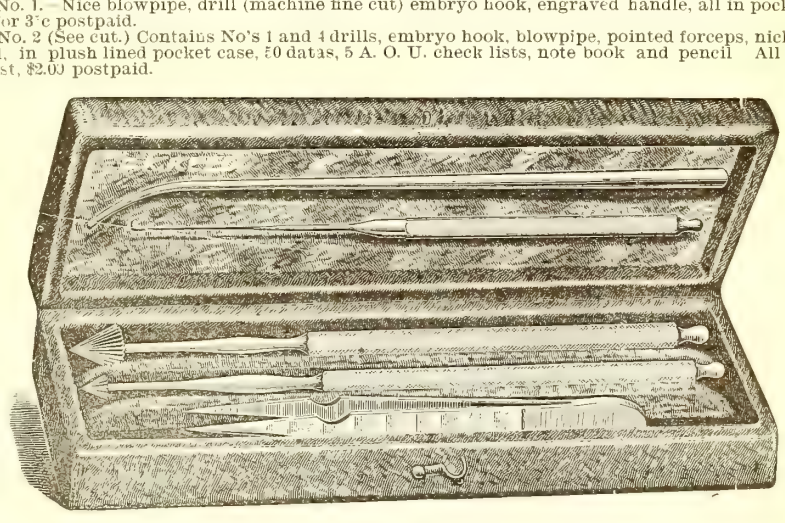

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100 var. foreign "	10
50 " " "	05
20 " " "	03
25 " " better grade	06

A mixed packet of stamps cataloguing from $4 to $6 for only $1 00

Postage extra on orders under 25c.

Above prices will only hold good while stock lasts.

MEEKER & LUCAS,
Box 296, Bridgeport, Conn.

Note our Prices on Printing.

5,000 Note Heads	$5.00;	10,000, $9.00
5,000 Good No. 6 Envelopes	5.00;	10,000, 9.00
5,000 Bill Heads	5.00;	10,000, 9.00
5,000 Statements	5.00;	10,000, 9.00
5,000 Business Cards	4.00;	10,000, 7.50

All work and stock guaranteed first-class. It will pay you to send your printing to A. M. EDDY, Albion, N. Y.

MINERALS,

Ancient Indian Relics, Stamps and Curiosities.
Price List, Postage Free.
W Perry Arnold, Stonnington, Ct.

SURPLUS.

For the past two years I have been endeavoring to unload an enormous stock of Specimens, Curios, &c. I have retailed, wholesaled and jobbed "carloads" of them but of a few items I had such an immense stock left on hand that no single dealer cared to shoulder the entire lay out, and since my large sale of stock and retail business to Mr. Short, a year ago, I've been unloading this "surplus" at Chautauqua, Lakeside, Fairs, Atlanta and through Premium Offers and Xmas Presents. I find, however, that I still have a "surplus" and that I'm apt to have one at the end of this season's campaign, but in order to avoid its being a large one I have concluded to offer the following during the months of April and May, after which I shall be busily engaged with my Resort Trade.

If you are "short" of CASH I can use *good* endorsed bankable paper or would even exchange for desirable sets of eggs, valuable U. S. and Department stamps or for anything in my "Want" ad. in NATURAL SCIENCE NEWS of February 25th or for anything in my line suitable to retail from my Chautauqua stores.

WHY DON'T YOU GET A "STARTER" TOWARDS A RETAIL, RESORT, FAIR OR EXCHANGE STOCK?

Small orders for single specimens will be filled at first column prices only, at which they are sent by mail or express prepaid. All prices given per 10 and per 100 are by express or freight at purchasers expense

Five can be selected at 10 prices; 50 at 100.

For $1.00 you can select anything on the list, at single rates, to the amount of $1.00 and I will send them to you prepaid and include a years subscription to either the OOLOGIST or NATURAL SCIENCE NEWS

$5.00. On an order amounting to $5.00 or over you can select *single* specimens of anything on the list at 10 rates.

$10.00. On an order of $10.00 you can select *single* specimens of any thing on the list at 100 rates.

By sending a $5 or $10 or you can get specimens at about ¼ usual prices, and at prices, on many things at least, which cannot be duplicated by purchasing in large quantities elsewhere.

If there is anything on the list that you can use I want to sell it to you even if that item amounts to only a few cents. If you find that you can use $25, $50 or $100 worth send me your list for inspection and I may be able to shade even these ridiculously low prices. The gist of the whole matter amounts to this: If I can convert this "surplus" into cash or stock which I can turn into cash during the next six months I'll not let any reasonable proposition pass by even if at a considerable loss to myself.

The stock I offer is A No. 1. Staple and saleable but I am overstocked. Let me hear from you. Address

FRANK H. LATTIN, Albion, N. Y.

MINERALS AND FOSSILS.

	Each	Per 10	Per 100
Scaphites nodosus, No. 1, small	10	50	3 00
" " 2, medium	25	75	5 00
" " 3, medium	50	1 25	10 00
" " 4, largest	1 00	3 00	25 00
Geodes, selected, 3 in	50	2 00	15 00
" chalcedony, Black Hills	25	1 50	12 50
Fossil Polyp Coral, small	5	30	2 00
" " " medium	10	40	3 00
" " " large	25	75	5 00
Flexible Sandstone, per lb	50	1 50	10 00
Coquina, per lb	35	75	5 00
Electric Stone, per lb	50	2 00	12 50
Gypsum, per lb	30	50	3 00
Fossil Shark Teeth	5	20	1 00
" " " selects	10	30	2 50
Students Mineral Collections. 50 selected 1½ in. spec'ns	1 50	10 00	80 00
100 Specimen Mineral Collections, extra fine, specimens In this collection have a retail value of 5 and 10c each	3 50	25 00	200 00
GEM STONES, small cut and polished semi-precious stones, many suitable for mounting			
Sard Trilby heart Intaglioes	15	1 00	7 50
Opals, Mexican	25	1 50	10 00
" "	50	3 00	20 00
Red Onyx	15	1 00	7 50
Black Onyx	15	1 00	7 50
Crocidolite, Tiger-eye	10	60	4 00
" " medium	15	1 00	7 50
" " select	25	1 50	10 00
Lapis Lazuli	35	2 00	15 00
Chalcedony, tinted	10	75	5 00
" varigated	10	75	5 00
" showing an artificial tree	15	1 00	7 50
Black Ribbon Agates	10	75	5 00
Red Ribbon Agate	10	75	5 00
Carnelian	10	75	5 00
Assorted, all the above and many others	10	75	5 00
Ditto. selects	15	1 00	7 50

MEXICAN IRIDESCENT WARE.

The following is from an article on Mexico, by Charles Dudley Warner in *Harper's Magazine*: "At Patzcuaro we found by chance, for it was not displayed for sale, something that interested us more than anything else made in Mexico. This was a true iridescent ware. The specimens we obtained were small, round and rectangular plates. The lustre is the true Saracenic, Alhambra, or Gubbio lustre, the real iridescence, shimmering, shifting colors in changing light, ruby, green, blue. Would it not be strange if this lost art were preserved in Mexico? The ware is rude. The makers have not the certainty of producing a particular color in a picture which distinguishes a Gubbio work, and it lacks the elegance and glaze, the solidity and fineness of the Alhambra tiles. But it is a genuine iridescence. The plates are exceedingly thin and brittle. The lustre seems to be metallic, of copper, and the effect produced by subjecting the ware to an exceedingly high temperature, a firing so fierce that the clay is apparently disintegrated, and has lost its ringing quality." The ware is very difficult to procure and ours is one of the first lots sent to the U. S. The small pieces are mostly in plaques and round or oblong dishes, small vases, baskets, bowls, kettles, etc. Most of the flat pieces have holes in one edge to hang up as plaques, but can be used equally well for card receivers, cigar ash receivers, jewel cases, etc.

Small pieces of Iridescent Ware, assorted	15	1 00	7 50
Pulque Cups of Iridescent Ware	35	2 00	15 00
" " " " " large	75	4 00	30 00
Sugar Bowls " " "	75	4 00	30 00

SHELLS.

	Each.	Per 10.	Per 100.
Peanut or Rope Shells	$ 03	$ 10	$ 50
Blued Cowry	25	75	5 00
Black Ear, small, rough	15	50	2 00
" " medium, rough	35	75	5 00
Scallops, *Pecten irradians*, dark valves	03	10	50
" " " light valves	05	25	2 00
Poached Egg Shells	25	75	5 00
Scallops—small white valves for fancy work	03	20	1 50
Snipe billed Murex	50	2 00	15 00
Strombus alatus, selects	15	60	4 00
" " ordinary	10	40	2 00
Goldmouths	15	75	5 00
Spider Shells	35	75	5 00
Cask Shells *Malea ringens*	75	3 50	25 00
Lettered Olive or Key Shells, small	05	20	1 00
" " " " medium	15	35	2 00
" " " " large	15	50	3 00
Japanese Eburnas	15	75	5 00
Lord's Prayer Cowries	35	2 00	17 50
Money Cowries	05	20	1 00
Mammoth Japanese Unio Valves	50	1 50	10 00
African Murex	75	3 00	20 00
Milk Strombus	35	1 00	7 50
Magpies, small	05	30	2 00
" medium	10	50	3 00
" large	25	75	5 00
Pearl Trochus	25	1 25	10 00
Paper Shells, *Sycotypus papyratia*	20	50	3 00
Marlin Spikes	25	1 00	8 00
Pink Murex	35	1 50	7 50
Rock Murex	25	75	5 00
Cardium, valves	15	20	2 00
African Murex, 2ds	25	50	3 00
Fox heads, small	25	75	5 00
" " 2ds	15	50	3 00
" large	35	1 25	10 00
White Murex, 2ds	15	60	4 00
Fulgur perversa, 10-12 in	75	1 50	10 00
Giant Fasciolarias 12-18 in	1 00	3 50	25 00
Kid Conchs	15	75	5 00
Camel Shells, *Ovulum gibbosum*	10	50	3 00
Angel wings, pairs, small	25	75	5 00
" " " large	75	3 50	25 00
Cardium isocardias	15	50	3 00
Orthalicus melanochilus	25	75	5 00
Liguus fasciata	15	50	3 00
Chama arcinella	20	75	5 00
Bleeding Teeth, selects, small	03	20	1 00
" " medium	05	30	2 00
" " large	10	60	5 00
Leaf-backed Murex, small	05	20	2 00
" " medium	10	50	3 00
" " large	15	75	5 00
Thorny-nosed " small	05	25	1 00
" " large	10	50	3 50
Bahama "	10	30	2 00
Silver lips	15	30	2 00
Dotted Cones	15	40	3 00
Dove Shells from British Guiana exhibit at World's Fair	03	10	50
Wheel Shells, *Rotella*	03	20	1 00
Keyhole Limpets	10	30	2 00
Helix fideles, Oregon	25	75	5 00
Wampum or Tusk Shells	05	20	1 00
Little Agate Shells, *Achatinella*	10	30	2 00
Partula gibba, Ladrones	10	30	2 00
Pythea pyramidata	10	30	2 00
Quoit Shells, 1 valve, *Dosina*	10	30	2 00
Australian Jewel Shells, 1-valve, *Trigonia*	15	60	5 00

LAND AND MARINE CURIOS.

	Each.	Per 10.	Per 100.
Eggs of Hammerhead Shark, selects	15	1 00	7 50
" " " seconds	10	40	3 00
Hermit Crab in Shell	35	1 25	10 00
Black Starfish, *Echinaster sentus*	35	2 00	15 00
Liver Beans	10	30	2 00
Yellow Sea Beans	03	10	50
Red " "	03	10	50
Black " "	03	10	50
Brown-banded Sea Beans	05	20	1 00
Rose Coral	15	50	3 00
Honey Comb Coral	25	75	6 00
East Indian Branch Coral	03	10	50
" " "	05	20	1 00
" " "	10	40	3 00
" " " "	25	1 00	8 00
Egg Cases of Periwinkle	25	1 00	7 50
Tarpon Scales	05	20	1 00
Acorn Barnacles	10	50	4 00
Skate or Sand Shark Eggs	05	20	1 00
Small Porcupine Fish	25	1 50	12 50
W. I. Spike Coral	03	10	50
" " "	05	20	1 00
" " "	10	40	3 00
Organpipe "	05	20	1 00
" "	10	40	3 00
" "	25	1 00	8 00
" "	50	2 00	15 00
Resurrection Plants	15	75	6 00
Sea Fans, small	15	50	3 00
" medium	25	75	5 00
" large	35	1 00	7 50
Sea Ferns, small	25	75	5 00
" medium	50	1 25	10 00
" large	75	2 00	15 00
Florida Gorgonias, assorted	25	1 00	7 50
Tarantulas mounted in box	60	3 00	25 00
Scorpions " "	40	2 00	17 00
Trap-Door Spiders " "	50	2 50	20 00
" " nests	30	1 50	12 00
" " " in boxes	60	3 00	25 00
" " " Redwood pails	55	3 00	25 00

Continued on preceding page.

NATURAL SCIENCE NEWS

VOL. II. No. 11. ALBION, N. Y., APRIL 11, 1896. Whole No. 63.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants." "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

A BARGAIN for some body. A 38 cal. 7 shot Winchester rifle, for only $5. cash. A good shooter. Address N. P. BRADT, Hindsburg Orleans Co., N. Y.

FOR SALE or EXCHANGE.—Philatelic Journals and Papers, for scientific books and magazines, minerals, herbarium specimens, etc. Send for list. CHAS G. NASH, 41 Grand St., Woonsocket, R. I. O

WILL SUPPLY a few birds in the meat such as Ducks, Gulls, &c. while season lasts. Skins if desired. A mounted Bald Eagle for sale, $15. WM. J. HEINZMAN, 1212 Monroe St., Sandusky, O. 63 2t

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ENTIRE set of Columbian stamps, unused, including all dollar denominations, best offer in cash or otherwise wins. Scott's price $28. D. H. HAIGHT, Goshen, N. Y. 63-2t

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WILL EXCHANGE Jewelry, also. cut Agate cubes, for fine minerals, fossils, woods, cut gems, or Indian relics. MISS A. F. RICE, Wollaston, Mass.

WILL EXCHANGE fine jewelry direct from manufactory, for dry or fancy goods, or other useful articles. Correspondence solicited. Miss A. F. RICE. Wollaston, Mass.

EXCHANGE NOTICE.—*Swiss Cottages*, Exquisite. Beautiful, from Lucerne, Switzerland worth 35c to $10 each. Will exchange for Indian relics, Geodes or Quartz Crystals. W. R. SOUTHWELL. Middletown, N. Y.

FOR EXCHANGE.—I will exchange a secret for traping foxes by scent which will call them ½ mile to the trap. The scent has to be made in April and it costs you nothing to make it, and until May 15 I will exchange the secret for $10 cash or $12 worth of such things as I can use in the line of Microscopes, Telescopes or Field Glasses, Mounted Birds, Rare Eggs, Books and U. S Stamps No cards answered. Address, WALTER E. McLAIN, Box 70, New Vineyard, Maine. 63-3tO

WANTED.—Pistol or revolver that shoots shot; one that will kill small birds at reasonable distance. Write, describing what you have, stating lowest exchange price in first class birds eggs. DANA C. GILLETT, Barre Center, N. Y.

BOYS WANTED to collect insects for me. Good pay. Write for particulars, inclosing stamp. PAUL L. SCHAEFER, 9959 Oak St., Sub-sta. 48., Chicago, Ills.

TO EXCHANGE.—A fine Turkish saber bayonet for good eggs in sets alsoColumbian stamps for eggs. CHARLES E. DOE, Box 1339, Providence, R I.

EXCHANGE.—Young white rats for birds eggs or for sale at 15 cents a pair. Have also a lot of duplicate birds eggs to exchange. ARCHIE H. CARUTHER, 60 Church St, Rutland, Vermont.

FOR SALE.—Choice sets of eggs valued at about $80. Will sell them for $35 cash. Have such sets as the rare Spotted Owl, Whistling Swan, Florida Dusky Duck, Golden-crowned Kinglet, Winter Wren, Siberian Gull, etc. ARTHUR W. BROCKWAY, Hadlyme, Conn.

FOR SALE.—Skins at one-fourth catalogue price. A. O. U. No's 6, 291, 249, 212, 333, 356, 357, 360, 409, 645, 388, 259, 501 or the lot sent prepaid for $2.50. H. S. MOODEY, 119 Mentor Ave., Painesville, Ohio.

COLORED PAPERS.—Something everybody needs, a package of 60 all different for only 10c. silver or stamps. N. P. BRADT, Hindsburg. Orleans Co., N. Y.

BEAUTIFUL Booklets of California Ferns, Flowers or Sea Mosses 50, 75c up to $1.50 for large size. 40 different sea shells correctly named, $1.50. Some spieces of shells in this list are priced at 15 to 25c each. Sets and skins for sets. Satisfaction guaranteed. Send lists and receive mine. EVAN DAVIS, Orange, Orange Co., California.

ARIZONA and California bird skins to exchange for those from other localities. *Fringillidæ* especially desired. WILFRED H. OSGOOD, San Jose, Cal. O

COLLECTORS Attention! Gulf Coast Eggs, Skins and Shells collected to order, cheap for *cash* only. H. E. PENDRY, Myers, Fla. ONtf

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CHEAP! I will send A 1 mounted Green-winged Teals (male or female) for $1 each postpaid. I have mounted birds, skins and eggs constantly for sale "I don't use embalming process." WM. M. BRAY, Taxidermist, Box 1453, Grinnell, Iowa. 63-2t

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OREGON EGGS. My entire collection, amounting to about $150 must be sold, regardless of price. Sooty and Oregon Ruffed Grouse, Macgillivray's Warbler, Varied Thrush, etc. Complete data. Price list free. ARTHUR L. POPE, McMinnville, Oregon.

DEAR SIR:—I am anxious to have you see a collection of the Famous Herkimer County Crystals, hence I make you this offer: If you are a subscriber to this paper, let me send you by return mail, post-paid, 36 of these Brilliant Gems; if they please you send me 72 cents, if not satisfactory return the collection and it will be O K. Yours respectfully, A. B. CRIM, Middleville, Herkimer Co., N. Y.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM, 15 Chestnut St., Providence, R. I. 51-25t

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"NATURAL SCIENCE NEWS," Vol. I complete. Less than ten complete vols. left. Will send you one for only $1.00. Complete your files. Will furnish Nos. 1 and 2 at 10c each. All others 5c each or in lots of five or more 4c each, or ten or more 3c each. (Nos. 1 and 2 are always 10c per copy net.) FRANK H. LATTIN, Albion, N. Y.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N. J. O. & N. t

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WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds." EDWIN E. HOWELL, 612. 17th St. N.W., Washington, D.C.

THOSE WANTING Chinese Ring-neck Pheasants (birds or eggs), deer, bear, or other Oregon birds or animals should address, MATTESON & MATTESON, Pheasant Breeders, Turner, Oregon. 59-6t.

CABINETS. Send 10 cts for photo of our speciality—Self Locking. Tperches—Oak samples by mail 8c, 10c and 15c; also stands, shields, glass cases, game panels, &c. Cabinets to order. HANAFORD CABINET CO., 139 and 141 W. Fulton St., Grand Rapids, Mich. 58MOtf

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"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c: Jan.-Feb., 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete*, *clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

SKIN LABELS LIKE THIS

Your name & the place printed here.

LEN.	WING	ST'CH
IRIS	BEAK	TAR'S
A.O.U.	DATE	♂ ♀

Printed on card board, punched holes; sent postpaid, 100, 25c; 500, $1. Egg datas with your name and address printed thereon, 25 and 35c per 100. Our specialty is data and label printing, but we have excellent facilities for all kinds of job work. THOS. H. BLODGETT, Galesburg, Ill.

FREE! 2 var. unused U. S. Depts. free to all sending for our approval sheets at 40 per cent. commission, enclosing 10 cents for postage, etc. A snap on U. S. Depts. 2c Int. Dept. 6c; 10c Int. Dept. 30c; 6c War Dept. 5c; 1c War Dept. 5c.; 2c. War Department, 5c.: *all unused*. U. S. on approval at 33⅓ per cent. Do you want any Philatelic Papers? We will send you 25 all different for 25c postpaid. A War Packet containing 25 different stamps from the following countries only: Cuba, Spain, Egypt, South African Rep., Venezuela, and Japan over one-half are unused—price only 25c. Satisfaction guaranteed or money refunded. MEEKER & LUCAS, Box 295, Bridgeport, Conn.

American Taxidermy,

A Series of 160 Photgraphs,

Animals, Birds, Heads. Etc.

Of great interest to

Sportsmen, Taxidermists and Naturalists.

List now ready.

Specials:

Ridgeway's Manual, revised edition.
Davie's Taxidermy, Hornaday's Taxidermy. Collecting Tube, Pistol Gun, Stuffed Birds for School Collections, Naturalists Supplies.

FRANK BLAKE WEBSTER CO.,
Hyde Park, Mass.

Come to Florida.

A fortune can be made in a few years in pineapples and tomatoes; vegetables raised the whole year. An ideal home. For particulars write **R. P. Osler,** Avon Park, Fla. 29&Otf

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester.....			8:00	10:30	2:20	5:35	10:00
Albion		7:00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge ..		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls.		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo.....		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo.....		6:25		11:00	1:30	5:00	5:5(
Niagara Falls.		6:35	8:05	11:18	1:40		6:00
Susp. Bridge .		6:45	8:10	11:25	1:48		6:05
Lockport.....	6:00	7:25	8:50	12:00	2:25	5:55	6:45
Albion.....	6:50	8:15		1:00	3:25	6:45	7:50
Rochester.....	8:00	9:20		2:05	4:35		9:00

Better Than a Shot Gun !

A Rare Chance

to obtain a high-grade Opera or FIELD GLASS at a very low price.

The entire stock of Queen & Co., Inc., being offered at great reductions, including some special forms for Naturalists.

Send for circular No. 481 giving full descriptions and prices.

J. G. GRAY, Assignee for

QUEEN & CO., Inc.,

1010 Chestnut St., PHILADELPHIA.

You Havn't an Idea

By seeing any other Geodes from any where else of the unique beauty of this new find of white CHALCEDONY GEODES on the Cheyenne River, S. D. Inside are sparkling crystals of pure quartz, selenite, microscopic, loose, perfect rhombs of calcite, milky, cfrost like, snow ball forms, or lavendar tinted;—7 kinds, all postpaid, for $1.75. Opened in halves and closed up and tied for you. Good size. Single Geodes, 15, 20, 25, 35, 40, 50. Nothing equal to them found in the world in my eleven years in the trade. Tons of fine MINERALS in stock for collectors and schools. ARROW HEADS sent on selection on catalogue terms. White River and Pierre Groups of FOSSILS. INDIAN RELICS of every sort. 200 subjects INDIAN PHOTOS. Stereo. Views of ALASKA and YELLOWSTONE PARK scenery. Catalogue for stamp.

L. W. STILWELL,

Deadwood, S. D

THE LITTLE MIDGET
SELF-INKING RUBBER STAMP.

Every Naturalist should have one. Sent complete with your name and address for only 50 CENTS.

E. BREWSTER MYERS,

Mfr of Rubber Stamps,

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R-I-P-A-N-S

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When answering advertisements always mention the NATURALSCIENCE NEWS.

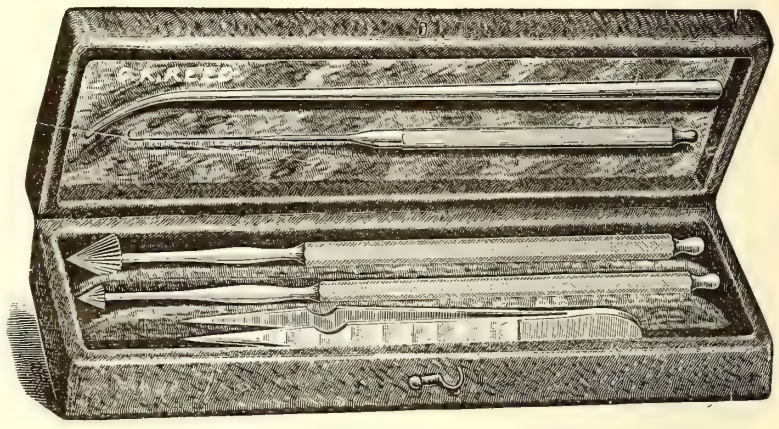
EGG TOOLS! EGG TOOLS!

THE VERY BEST THAT CAN BE MADE.

Set A contains blowpipe, (white metal) a large and small wire drill, 5 datas, only 20c postpaid.

Set No. 1.—Nice blowpipe, drill (machine fine cut) embryo hook, engraved handle, all in pocket case, for 35c postpaid.

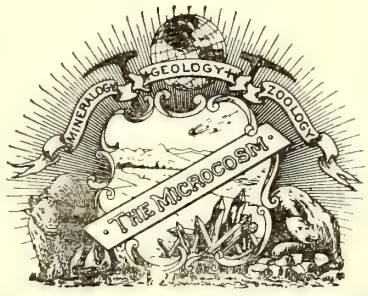
Set No. 2 (See cut.) Contains No's 1 and 4 drills, embryo hook, blowpipe, pointed forceps, nickel plated, in plush lined pocket case, 50 datas, 5 A. O. U. check lists, note book and pencil All of the best, $2.00 postpaid.



CHAS. K. REED, TAXIDERMIST.

And Dealer in all Naturalists' Supplies, Minerals, Shells, etc.,

262 Main St., WORCESTER, MASS.



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Washington School Collections.

Minerals, Rocks and Invertebrate Animals

t is safe to say that no collections of equal excellence have ever before been offered in this country at so low a price ($2 each). Send for circular.

EDWIN E. HOWELL, 612 17th St., N.W., WASHINGTON, D.C

A Good Potato is "King of the Roses,"

And I will deliver a whole flour barrel full of them, f.o.b., Albion, N. Y., for only $1.25. When ordering state whether you prefer No. 1 (Merchantable) or No. 2 ("hen's egg") size. Many prefer No. 2 for planting.

If you want the potatoes and prefer to exchange eggs in sets or other specimens, or any of the books, as per my list of wants in NATURAL SCIENCE NEWS of Feb. 29th, write me, I think we can arrange a "swap."

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FRANK H. LATTIN, Albion, N. Y.

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"Scienec in Schools."

Dr. Morris Gibbs' article on "Science in Schools," in NAURAL SCIENCE NEWS, of April 13th, 1895, comes very near to my "hobby," and I wish all parents and teachers might read and act upon it, but it seems very important that the teachers should be competent as well in this as in other branches of study.

The science of natural history is one that can be so easily learned at an early age, and the truth of some statements are so easily proved or disapproved, that quite young students, who have a taste for the study, are often amused by things that are told them by the teacher.

A young boy, who spends most of his time in out-door study, copied in his note-book some of the strange things told him by the teacher, and remarked that "he chewed his lead pencil all to pieces to keep from laughing." In regard to insects, she said: "The larva was small eggs deposited by insects;" in describing the various families of birds she put the Killdeer Plover among the scratchers, and said of the woodpecker family "most of them had long *curved* bills.

Of course this could hardly be the fault of the teacher, as "Nature Study" is of comparatively recent date, and was not given in her examination; but how much can children learn of this subject unless better taught? Almost any bright, active boy has noted the long, straight bill of the woodpecker, and knows the feet of the killdeer never were made for scratching.

Now I have come at last to my special "hobby," and that is that parents should not only study the subject more, but also teach it to their children, or study it with them, at a very early age. Go out into the woods and fields with them, teach them to notice, first of all, and I care not if the first lesson be of flower, insect, bird or animal, one thing always leads to another in this line, and the more they learn the more they want to learn.

Oh, mothers! refuse some demands of society, neglect some new style in clothing that would require hours of labor, and go out with your children into the broad sunny fields, or cool shady woods and let no song of bird escape your ear, no delicately tinted leaf or gorgeously colored flower be lost to your eye's sight. If a strange, sweet perfume comes to your nostrils from flower or leaf, hunt it out. Leave no stone unturned that may be the hiding place for insects, or better still, may contain the fossil remains of some other insect or Mullusk, long since become extinct.

Of course you may not know all, or even much, about these things, but be sure your children will want to know "all about it" and will soon go far ahead of you, and that is what you want; and good old Kingsley's "Madame Why and Lady How" are the best teachers a child can have.

MRS. R. SIM,
Jefferson, Ohio.

A Geological Expedition to Patagonia.

Princeton College has planned another important geological expedition. Prof. J. B. Hatcher, Curator of the Museum of Vertebrate Palaeontology, accompanied by Mr. T. A. Patterson, formerly connected with the American Museum of Natural History in New York, has sailed for Patagonia. The explorations on the coast of Patagonia which were conducted by Prof. Darwin in his famous voyage in the Beagle, nearly half a century ago, first directed the attention of geologists to the great scientific importance of that inhospitable land. In later years the work he inaugurated has been prosecuted by the Argentine palaeontologists, Burmeister, Moreno and the brothers Arneghino.

The latter brought together a large collection of fossil mammals and birds and made important studies upon them, although they labored under great difficulties on account of the absence of material from the northern hemisphere for comparison. Two years ago St. Morens, the director of the Museum of La Plata, invited Mr. Lydekker from England to study the collections of that museum and to employ his extensive knowledge of the collections of Europe and Asia with the purpose of comparison with the fauna of South America. Mr. Lydekker has published two large volumes as the result of his studies, which though interesting and important, show that a vast amount of work remains to be done on the geology of Patagonia.

Princeton has now taken advantage of this opening and has sent out a well-equipped expedition. After studying the collection in Buenos Ayres, Mr. Hatcher will sail for Patagonia and then strike inland; the principal objects of the expedition are to make a thorough study of the Patagonian geology, which has not as yet been undertaken by a competent observer, and secondly to make as exhaustive a collection as possible of the fossils which are so abundant there, and which will be brought to Princeton for study and comparison with those of the North. Though the principal objects of the expedition are thus seen to be geological and palaeontological, the other natural sciences have not been neglected. Preparations have been made to form extensive collections in the mineralogy, zoology and botany of Patagonia and Terra del Fuego to enrich the Princeton Museum. A complete photographic apparatus has been taken along so as to get a large collection of views illustrating the geology of the country and the customs of the natives. Mr. Hatcher also holds two commissions from the United States government, one from the Department of Agriculture and one from the Bureau of Ethnology, and the officers of the government have done everything in their power to render the expedition successful.

Mr. Hatcher goes with practically an unlimited leave of absence, and the results of his researches promise to be very interesting.—*Scientific American.*

Progress of Scientific Work.

A year or two ago attention was called to the prediction of an eminent authority that we were entering upon a period of scientific activity that would far transcend any previous experience. The most indifferent observer cannot fail to be amazed at the manner in which this prophesy is being fulfilled. Chemists are surprised to find that the long familiar atmosphere contains a large proportion of a substance hitherto unknown—the strange and inert argon; and helium, so long known in the spectrum of the sun, is discovered as a terrestrial element. With the liquefaction of air and hydrogen we are introduced to new chemistry of cold. The development of the electric furnace brings great possibilities in the reduction of certain metals, and among its remarkable products yields calcium carbide, the source of acetylene, which is the first hydro-carbon to be produced artifically on a large scale, and a revolutionary achievement in chemical synthesis. Most surprising of all is the new form of radiant energy. Eager students everywhere have quickly begun experimenting with the mysterious X rays, and in a few days we are given the new art of "shadowgraphy," which promises, among other marvels, that the sick can have their diseased organs brought to view, while the curious can have their skeletons photographed while they wait. The details of this new photography are being improved daily. Other epoch-making discoveries are almost grasped, and it is clear that, with so many roads opened to peaceful conquest, our end of the century days leave no time for demoralizing wars over political boundaries.—*Mining.*

Prairie Dogs and Their Neighbors.

For many years and I believe even yet to some extent, it has been held that prairie dogs, burrowing owls, and rattlesnakes, occupied burrows in common and in peace but I have never been able to reconcile myself to the idea.

Dogs and owls might agree, but the addition of a snake would be very apt to upset the domestic harmony.

Believing this I have always taken great interest in articles relating to the matter, but a chance acquaintance, whom I met in this city has given me a great deal of light on the subject, and as his observations suited my own theory I was very much pleased to learn what I could from him.

He had been for a number of years a rancher in South Dakota, and as there were several villages near his home he had every opportunity for observation.

In the spring as soon as the bright days commence the dogs come out of their burrows, and in fact are often seen before the spring fairly sets in, if a few warm days come.

Old and young dogs live in the same burrows in winter, but in the spring start out for themselves, the young females showing their inclination to matrimony, by their peculiar actions, probably with an eye to attracting the attention of the males.

They walk a short distance then erect themselves on their hind legs with fore paws in the air, at the same time uttering a peculiar squealing noise.

Soon a male will come up and after satisfying themselves as to the suitability of each other they start off to make their home, and after trying a number of places will finally get one to their likeing, and the work commences.

The hole is generally about five or six inches in diameter, though it becomes larger through use; and all the dirt that is taken out, is placed in a space about two feet in diameter around the burrow, being brought up in little balls in the fore paws of the animals.

These burrows are sometimes very deep: in one instance my informant cited, a neighbor of his was digging a cellar, and after completing it to a depth of thirteen feet had not come to the end of a burrow.

Rattlesnakes are almost always found around dog villages, but why should they not? A nice young prairie dog is probably as juicy and nice a morsel as they can wish, and they can always have it for the chasing.

In two instances my friend told me he had killed large rattlers and noticing they had a considerable bulge in them, cut them open, and found they contained young prairie dogs, one not yet dead, though it died soon after.

These dog villages are one of the greatest pests to the rancher, and every expedient is used to get rid of them. One of the most efficient is to drown them out, but it requires lots of water and more patience

It was in a deserted hole treated in this way that my friend noticed one of the burrowing owls, and on closer investigation, found that it had hollowed out a little place just inside the burrow to sit in, where it could look out.

He had never seen any of the owls in a burrow regularly occupied by dogs, and did not think they ever occupied burrows in common.

E. G. Haymond,
Seattle, Wash.

Curiosity of Plant Life.

It has been long been considered very curious, that the two lobes of the leaves of the *Dionæa*—the Venus flytrap—will close over and capture an insect that alights on the leaf, and more recent study shows that the plant really eats the insects it captures. But little is yet known of the nature of the mechanism by which it is enabled to do such marvelous work. Dr. J. M. Macfarlane has recently discovered that leaf blades will not respond to a single touch. No matter how severe a single stimulus may be, the blades will not close. There must be a second stimulus before an attempt at closing is made. But even here the stimuli must have an interlude. If the two stimuli follow closely, no response follows. Dr. Macfarlane finds that there must be a period of nearly a minute, fifty or sixty seconds, between the two. There is, however, some variation under different temperatures. The effect of the first touch or stimulus will be retained for some four minutes. The second excitation, if made after that, stands as an original motion, as a parliamentarian might say. Those who are fond of speculating on the "motives" of plants will see in this a wonderful provision of nature, most wonderful possibility than anything that has yet been brought out in connection with plant life. Knowing now, as we do, that the leaf closes on the insect for the purpose of eating it, there should be some way of discovering whether that which alights on the leaf's surface is eatable or not. It has no eyes to see with, so it cannot tell whether it is a

piece of wood, stone or other inorganic material that is tempting it, as a living creature could. Such material falls, and remains still on the leaf. But an insect struggles, and by this struggle the plant receives intelligence that it is a living thing. Here also may be seen the advantage of a brief interlude between the stimuli; a piece of gravel might rebound—might make two stimuli close after one another. An insect would wait a short time to collect its senses, and formulate some plan of escape. It is very clear that this ability to discern between the animate and inanimate saves the plant from a great amount of useless labor. The discovery of Dr. Macfarlane is probably the most wonderful of all wonderful things that have been discovered in the behavior of plants. Mr. William Canby had already discovered that if a leaf had been "fooled" into closing over a piece or inorganic matter, it soon opened and let it out again. Mr. Macfarlane finds that when it catches an insect, it remains closed over it for twelve or fifteen hours—long enough to consume it. It takes eight or ten hours after an insect is caught before the acid—which in Drosera Mr. Darwin found analogous with pepsin, the leading destructive element in the gastric juice—flowed evenly over the whole surface of the leaf. The leaf surface is subject to stimuli equally with the hair.—*The Independent.*

The Balitimore Oriole.

In her *Birdcraft* Mabel Osgood Wright relates the forgoing interesting bit of tradition counected with the naming of this bird:

"George Calvert, the first Baron Baltimore," writes she, "is the subject of a tradition which still lingers in Maryland, and has sufficient facts for a foundation to be credible. The story says that Calvert, worn out and discouraged by the various trials and the rigors of temperature in his Newfoundland colony, in 1628 visited the Virginia settlement. He explored the waters of the Chesapeake, with its noble tributaries and delicious climate, and found the shores and woods teeming with birds, and among them great flocks of orioles, who so cheered him with their song and color that he took them as good omens and adopted their colors for his own. Be this as it may, it is a likely story; for the ortole has gone on cheering mankind io this day."

BIRDS OF WESTERN NEW YORK.

ERNEST H. SHORT.

Introduction.

In placing this revised and enlarged list of our birds before the public I have no excuse to offer except that my object as stated in the introduction to my first edition i. e. "to bring the subject before other ornithologists—that we might some day bring it to completion," has been realized to a very satisfactory degree. While this list is still very incomplete, it embraces over twenty species omitted from the first one, I have seen fit to omit A. O. U. No. 4, *Columbus nigricollis californicus.* as further evidence of its occurrence was not forthcoming and I could not find the skin that I understood had been taken on Lake Ontario in 1892. I wish to tender my sincere thanks to Mr. Neil F. Posson of Medina, Orleans Co.; Mr. J. L. Davison, Lockport, Niagara Co.; Mr. Frank H. Lattin, Albion, Orleans Co.; Mr. Leslie V. Case, Naples, Ontario Co.; and others for notes and other help.

I am especially indebted to Messrs., Davison and Posson for complete lists of the birds of their respective localities.

Trusting that this may prove only another step toward a complete list, I am respectfully, THE AUTHOR.

April 1, 1896.

Order PYGOPODES. Diving Birds.

Family PODICIPIDÆ.—Grebes.

2. Holbœll's Grebe. *Colymbus holbœllii.* Rare migrant; one reported by J. L. Davison as taken at Wilson, N. Y., on Lake Ontario, May 4, 1887.

3. Horned Grebe. *Colymbus auritus.* Migrant; most common along Lake Ontario in the spring.

6. Pied-billed Grebe. *Podilymbus podiceps.* Summer resident. Breeds in suitable localities.

Family URINATORIDÆ.—Loons.

7. Loon. *Urinator imber.* Common migrant, especially on Lake Ontario.

11. Red-throated Loon. *Urinator arcticus.* Occasional migrant. One taken at mouth of Oak Orchard Creek, Orleans county, during February, 1893.

Order LONGIPENNES. Long-winged Swimmers.

Family LARIDÆ.—Gulls and Terns.

47. Great Black-backed Gull. *Larus marinus.* Rare migrant, reported by J. L. Davison also by G. F. Guelf of Brockport, Monroe Co., N. Y.

51a. American Herring Gull. *Larus argentatus smithsonianus.* Occasional straggler during spring migration.

54. Ring-billed Gull. *Larus delawarensis.* Occasional migrant.

60. Bonaparte's Gull. *Larus philadelphia.* Rare migrant. One shot near Albion, Orleans Co., in 1892.

70. Common Tern. *Sterna hirundo.* Occasional migrant. One shot at Chili, Monroe Co., 14 miles from Lake Ontario.

72. Roseate Tern. *Sterna dougallii.* Rare migrant. Reported by Mr. Davison as taken at Youngstown, on the Niagara River, May 31, 1886.

77. Black Tern. *Hydrochcelion nigra surinamensis.* Rare migrant. Confined to vicinity of Lake Ontario.

109. Wilson's Petrel. *Oceanites oceanicus.* Very rare straggler. J. L. Davison reports a specimen taken October, 1875, by a sportsman while shooting Plover near Lockport.

Order STEGANOPODES. Toti-palmate Swimmers.

Family PHÆTHONTIDÆ.—Tropic Birds.

112. Yellow-billed Tropic Bird. *Phæthon flavirostris.* A bird of the Tropics and rare in the Gulf States. Rev. J. H. Langille reports that a young male of this species was brought to him alive at Knowlesville, Orleans Co., in September, 1878. It was found in a field after a heavy storm from the southwest.

Order ANSERES. Lamellirostral Swimmers.

Family ANATIDÆ.—Ducks, Geese and Swans.

129. American Merganser. *Merganser americanus.* Migrant. Most frequently seen in spring.

130. Red-breasted Merganser. *Merganser serrator.* Migrant, not as common as last.

131. Hooded Merganser. *Lophodytes cucullatus.* Migrant. Most common on the lake in spring.

132. Mallard. *Anas boschas.* Migrant. Occurring in small scattered flocks or most commonly in detached couples.

133. Black Duck. *Anas obscura.* Common migrant on inland streams; coming in large flocks. Breeds in suitable places.

137. Baldpate. *Anas americana.* Migrant. Occurring in small flocks.

139. Green-winged Teal. *Anas carolinensis.* Migrant. Occurring in small flocks and detached couples, chiefly on secluded streams.

140. Blue-winged Teal. *Anas discors.* Migrant, habits like last.

142. Shoveller. *Spatula clypeata.* Occasional migrant. One shot at Chili, April 14, 1894.

143. Pintail. *Dafila acuta.* Migrant, common.

144. Wood Duck. *Aix sponsa.* Migrates in isolated couples; a few staying to breed in suitable localities.

146. Redhead. *Aythya americana.* Common migrant on the Lakes. Have often seen them in the Rochester markets, brought in from Lake Ontario. Rare inland.

147. Canvas-back. *Aythya vallisneria.* Rare migrant.

148. American Scaup Duck. *Aythya marila nearctica.* Migrant.

149. Lesser Scaup Duck. *Aythya affinis.* Migrant. May possibly breed as I have found them here in May.

150. Ring-necked Duck. *Aythya collaris.* Migrant. Common on Lake Ontario.

151. American Golden-eye. *Glaucionetta clangula.* Rare migrant. One taken at Chil, in October, 1893.

153. Bufflehead. *Charitonetta albeola.* Migrant. Seen in couples.

154. Old-squaw. *Clangulu hyemalis.* Migrant, chiefly confined to the lake.

167. Ruddy Duck. *Erismatura rublda.* Rare migrant. One shot in April, 1891, at Chili, Monroe Co.

172. Canada Goose. *Brania canadensis.* Common migrant.

[TO BE CONTINUED.]

A Fasting Spider.

I have in captivity, a spider that has not eaten anything for over a hundred days. It is just a common little house spider, and was placed in a glass globe on July 2d where he at once spun himself a web. The next day I dropped in a dead fly, but he refused to partake; thinking he preferred living victims, I put in two live flies, but he refused them also.

A few days later I put a few drops of water in the globe, a drop of which hung in the web to which he immediately ascended and sucked it nearly all up. The two flies died, and all are still laying in the globe untouched. I have put *nothing* in the globe since, but Mr. Spider is just as lively as ever.

I do not know much about spiders, and for all I know this fasting business may be nothing unusual, but I would like to know *what* the spider subsists on.

Morris Rice,
Kinloch, Mo.
Oct. 14th, 1895.

Wild Rice.

Few know more of the reed of our mud-flats than that it furnishes the food on which fattens for the epicure the reed-bird of autumn dinner tables—the bobolink of other seasons. But as wild rice—*Zizania aquatica* of science—it has played no mean part in the service of man. It was the staple food of the Indians that formerly inhabited Northern Wisconsin and Minnesota, where the plant abounds on the margin of lakes. Dr. Elliot Coues says that it is still the chief recourse of the Objibway Indians on the reservations of Minnesota. They not only gather it for their own use, but for the purpose of trade. A common name is Indian rice, and the lakes along which the plants abound are known as rice lakes. Whole Indian villages will be tenantless in autumn, the inhabitants having gone "ricing," as the harvesting is termed. The Indians push their canoes into masses of rice, bend the heads of rice over a crotched stick, and thrash the grain into the bottom of the boat.—*Independent.*

$2 for $1.

During the balance of '96, or as long as present stock holds out, I will mail every person sending me $1.00 for a year's subscription to either the NATURAL SCIENCE NEWS or THE OÖLOGIST, their selection from goods mentioned in this list to the amount of $1.00. ($2.00 will secure *both* publications one year and $2.00 worth of goods.) Every subscriber to the NATURAL SCIENCE NEWS also receives two coupons, each good for a Want, Exchange or For Sale Notice, and every subscriber to the OÖLOGIST receives a card good for one notice. Send in your subscriptions at once—earliest ones are sure to get exactly what they want. Make a combination with a friend—you take the premium, he the publication or *vice versa*. Make remittances in most convenient manner. Address plainly and in full,

FRANK H. LATTIN, Publisher, Albion, Orleans Co., N. Y.

EGGS.

Your selection of any species, either in sets, singles or 2d class, listing at $1.00 or under at Lattin's "Standard Catalogue" prices. When selecting this premium you must *always* name extras to be used as substitutes to the full amount of your order. If the selection of eggs is left entirely with us we will send $1 25 worth instead of $1.00 worth—and you can if you wish suggest whether your prefer eggs of eastern, western, northern or southern species or whether you wish eggs of land, sea or fresh water species.

SCIENTIFIC SHELLS.

Your selection from species listing at $1.00 or under as offered in Lattin's Shell List in his June ('95) BULLETIN. When selecting this premium "extras" must always be named to fully equal the amount of the order. If the selection of scientific shells is left entirely with us we will send you shells that will list at Ward's prices to the amount of $1.50 instead of $1.00, and if you desire you may name the families from which you especially desire your selection to be made and we will comply with your desires as near as possible.

SHOWY SHELLS.

Any species catalogued at $1.00 or under in Lattin's old pink catalogue—always name a few extras when selecting this premium. If you are not familiar with the names of shells it is advisable and always more satisfactory to leave the selection with us.

CORALS.

Precious, *Corallium rubrum*, 1 oz. package of polished branches ..... $ 25
Rose Coral, *Manecina areolata* 10, 15, 25
Organpipe Coral, *Tubipora musica* 10, 25, 50. 1 00
Spike Coral, *Madrepora cervicornis* 10
Branch Coral, *Pocillopora bulbosa* 10, 25
Yellow Sea Fan, *Rhipidogorgia occatoria* 15, 25, 50
Purple Sea Fan, *Rhipidogorgia flabellum* 15, 25, 50
Creamy Sea Fan, *Rhipidogorgia elegans* 25, 50, 75
Purple Sea Feather, *Pterogorgia setosa* 25, 50, 1 00

We have dozens of other species of corals but not in sufficient quantity to list. We can however put you up choice collections of other species to the amount of $1.00, $2.00 or more.

ECHINODERMS.

Sand Dollar, *Echinarachnius parma* 10
Philippian Urchin, *Loganum bonani* 35
White Spinned Urchin, *Hipponoe esculenta* .. 35
"Aristotle's Lantern" the sea urchins dental apparatus 15
Giant Purple Urchin, *Strongylocentrotus franciscanus* 50
King of the Echinoderms, *Metalia pectoralis* 2 00
Black Starfish, *Echinaster sentus* 35

We have dozens of other species of Starfishes and Sea Urchins and would gladly select a $1 collection of either as a premium.

FOSSILS.

Shark Teeth ..... $ 5
Trilobite, *Calymene seraria* 25, 50, 75, 1 00
Scaphites nodosus 10, 25, 50, 1 00
Polyp Coral 10, 25

We have hundreds of fossils but not in sufficient quantity to list—can send collections of $1.00 or more in value if desired.

MINERALS.

Chiastolite Crystals ..... $ 15
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Geodes, Quartz, both halves 50, 1 00
Chalcedony Geodes, Black Hills, *select* 35
Chalcedony Geodes, Black Hills, unopened ... 15
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Gem Stones, small cut and polished semi-precious stones of almost every conceivable form, shape, size, color and style, ranging in size from ¼ to ¾ inch in diameter, Carnelian, Heliotrope or Bloodstone, Chalcedony, Clouded Agate, Banded Agate, Fortification Agate, Ribbon Agate, Brown Agate, Red Agate, Black Agate, Moss Agate, Agatized Wood, Mocha Stone, Dendritic Agate, Brecciated Agate, Onyx (in great variety), Sard, Sardonyx, Agate-Jasper, Lapis Lazuli, Crocidolite (Tiger eye), Fossil Corals, Wood Agate, Rock Crystal, Amethyst, Aventurine, Intaglioes, Opals, etc., etc. Fully one-half of them are suitable for jewel purposes, and if you wanted one mounted to replace a setting in a pin, cuff button, watch charm, ring top, or in other jewelry, your jeweler would charge you all the way from 25 cents to $1 for one of these identical stones (jewelers are buying these stones for this very purpose). When ordering state variety desired 10, 15, 20. 25
1 doz. assorted, my selection, culls 50
1 doz. assorted, my selection, choice 1 00

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" " " 6 var 50
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Trap-door Spider in Redwood Pail 55
Yucca Palm Cushions, 2½ in 15
" " ¾ " 3¼ in 25
" " " 4 in 35
Shark Teeth, select 10
"Eye Stones" 10
Oregon Bird Arrow Points ..... 25 to 75
Arrow and Spearheads of various material and from many localities, each ..... 5c to 1 00
Same, assorted per doz. ..... 50c to 3 00
Small Alligators, mounted 75

MEXICAN GOODS.

Iridescent Ware, small ..... $ 15
" " 6 all different 75
" Pulque Cups 35
" Sugar Bowls 75
Mexican Onyx Palettes with Indian Feather work:—Hummingbirds, etc 1 00
Purses knit from fibre of Spanish Bayonet 35
Watchman's Whistle of Clay, a great novelty 15
Pottery Fruit Banks, unique 50

FOREIGN STAMPS, ETC.

Packet, 100 var ..... $ 15
" 100 choice mixed, retail 1-5c 35
" 1000 mixed 50
Sheet of 25 selected 1c stamps 15
" " 25 " 2 " 30
" " 25 " 3 " 45
" " 25 " 4 " 60
" " 25 " 5 " 75
Set of 6 var., unused, 1 to 50c, Venezuela, 1880 15
Set, 4 var., used, Chili Telegraph 25
Set, 7 var., unused, Ecuador 15
Set, 4 var., used, Ecuador, '92 10
Set, 20 var., unused, French Colonies 40
Set, 6 var., used, Guatemala, 1886 35
1c unused Guatemala prov., 1886, surch 10
4r unused, Guatemala, 1878 10
¼r unused, Guatemala, 1879 10
10c Vermillion, unused, New Brunswick, 1860 25
5c on 3c unused, British Honduras, prov., 1891 10
1c used, British Guiana, 1880 5
Popular Album, linen boards, 1200 spaces, 60 ill. pages 15
Philatelists Album, boards 35

BOOKS &c.

Apgar's "Key to Birds of N. E. U. S." ..... $ 50
Chapman's "Birds of Eastern North America." 3 00
Earl's "Pets of the Household" 50
Ingersoll's "Bird-Nesting" 1 25
Langille's "Our Birds in Their Haunts" 2 00
McIlwraith's "Birds of Ontario" 2 00
Stearn's "Bird Life in Labrador" 60
Bird Preserving and Bird Stuffing 35
Maynard's "Manual of Taxidermy" 1 25
Lattin's "Standard Catalog. of Eggs" (1896) 12
Stearn's "Notes on the Natural History of Labrador" 50
Eberhart's "Elements of Entomology," 40 plates—300 figures 50
Eberhart's "Outlines of Economic Entomology" 50
Eberhart's "Key to the Families of Insects" 25
The Pistol—A practical handbook on its Use and Care 50
Amateur Trapper and Trap-maker's Guide 75
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THE OOLOGIST, Vol. III and IV nicely bound 75
THE OOLOGIST, Vol. IX, 1892, 298 pages bound 1 00
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Same in NATURAL SCIENCE NEWS 25
A year's subscription to THEOOLOGIST with exchange card 50
A year's subscription, with two exchange coupons, to NATURAL SCIENCE NEWS 1 00
Advertising space in OOLOGIST or N. SCI NEWS to the amount of $1.00. Should you desire to select this premium and not care to use the space at once a credit card will be issued for the amount which you can use when needed 1 00
PENIKESE, the 23 issues of NATURAL SCIENCE NEWS, containing this valuable serial complete, on Agassiz's famous summer school at Penikese Island, written by an eminent Professor who spent both seasons at the Island 50
THE OOLOGIST, a package of forty (40) back number, all different, *my selection* 75
Directions for collecting minerals 05

PEOPLE'S POPULAR HANDBOOKS.

We have sold thousands of this popular series of Handbooks. Each contains 64 double column, 6x8 in. pages filled with valuable information, etc., etc., complete descriptions of entire series for 1c stamp. Price *prepaid*, each 10cts.; 4 for 25cts.; 10 for 50cts.

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7 Mrs. Partington's Grab-bag.
10 Famous Comic Recitations.
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12 Minstrel Show; Burnt Cork Comicalities."
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17 Practical Poultry Keeper.
18 Twelve Complete Novelettes.
19 Big Value Premium Budget.
21 Mystic Oracle or Fortune Teller and Dream Book.
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23 Widder Doodle's Love Affair.
25 Book of Home Amusements.
27 Book of Dialogues.
28 How to Train Animals.
30 Modern Etiquette.
32 Every Boy His Own Toy Maker.
34 Art of Ventriloquism.
35 Ladies' Guide to Beauty.
36 Parlor Magic.
37 Phrenology Made Easy.
39 An Old Hunter's Tales of Adventure.
40 Spoopendyke Papers.
41 Famous Dialect Recitations.
42 Snap Shots from Many Humorous Writers.
43 Gurney's Lessons in Short Hand.

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Double Pendant Satin Spar Stick Pin	$ 15
Quartz Crystal Stick Pins	35
Brazilian Beetle Stick Pins	35
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Crocidolite Brooch	75
Agate Shoe Buttoner	75
Agate Glove Buttoner	50
Agate, Moss Agate, Tiger Eye, etc., Watch Charms	35
Agate Stamp Box	1 00
Pearl Penholders	35, 75
Pearl Letter Openers	50
Pearl Shell Spoon	35
Pocket Magnifier	35
Shell Napkin Ring	35
" Purse	25
" " fine	75
" Ship, thimble holder with thimble	40
Shell Match Safe	35
" Brooch	25
Souvenir Spoons, King Crab Tail handles Pecten and Cardium valve bowls	25, 35, 50
Carnelian Marbles, genuine	15
Bone Penholders	15
Bone Penholders, combination	25
Olive Wood Penholders	15
King Crab Tail Penholders, new and unique	15
Florida Fancy Palmetto Fans	35

New Subscribers.

New subscribers to my publications, THE OÖLOGIST and NATURAL SCIENCE NEWS are always in demand and during 1896 its publisher will give 50 cents worth of premiums for each new subscriber a present, *paid up*, '96 subscriber may send him This 50 cents worth of premiums must be selected from the list of premiums given on this page *and ten cents must be added to cover the mailing expenses of the present* Remember the new subscriber can accept the $1 premium offer and will secure all the perquisites connected with the same or he can pay 50 cts. for either publication alone and this 50 cents worth of presents is an additional offer on our part made to present, *paid up*, '96 subscribers who will assist in enlarging the subscription list of our publications.

Natural Science News.

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Only 5c per norparell line, each insertion. 12 lines per inch.

Nothing inserted for less than 25 cents.

SPECIAL RATES as given below will be made to parties using a large amount of space, either in a single issue or any number of issues throughout the year. The only condition being that the space contracted for must be taken up within the year; and can be used in large or small quantities, as their business requires.

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It is the only publication in America in which dealers and collectors are sure of having their notices placed in the hands of all working Naturalists almost as soon as if done by addressing each by letter—while in an ordinary monthly publication there is natural delay of from 10 to 30 or more days.

In the NATURAL SCIENCE NEWS this delay will be obviated.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in a given number.

MINERALS,

Ancient Indian Relics, Stamps and Curiosities.

Price List, Postage Free.

W Perry Arnold, Stonnington, Ct.

Not a Fire or Removal Sale!

I need space and am going to sell at a sacrifice to reduce my stock and make room. All these goods are *first class* in every respect.

Send money in most convenient way. All items marked "mail" go PREPAID at prices quoted if your order amounts to 50 cents or over. Under 50 cents, 5 cents extra. Those marked "express" go at purchasers expense. Everything properly labelled and carefully packed.

Address plainly

ERNEST H. SHORT, Albion, N. Y.

INSTRUMENTS and SUPPLIES.

	Reg. price.	Spec price
Eye instrument for taxidermists, very handy in inserting glass eyes, by mail	$ 75	$ 54
12 in. scissor-handled stuffer, by mail	1 75	1 38
Quart jar arsenical soap, ready to apply, express	85	75
Large cake arsenical soap, dry, express	1 00	80
Box of bird lime, best imported, by mail	50	32
Artificial fern leaves, large, by mail per doz	65	38
Artificial leaves medium sizes assorted, by mail per doz	15	9
Lichens, per package by mail	15	7
Grasses, per bunch, by mail	20	13
Cherry stands (Hawk size), express (by mail 10c extra)	45	32
Flat decorated stands for game and shorebirds, my mail	45	30
4 in. nickle plated caliper, marked in mm. and 20ths, without screw, by mail	1 00	78
6 in. steel rule, marked in mm. and 100ths, by mail	1 00	74
Catapult gun with rubber, for killing small birds, by mail	15	11
10 in. brass blowpipe, state whether you wish it for eggs or minerals, by mail	25	18
Same, 12 in	30	22
Hand blower complete, for oologists, saves your wind, by mail	1 60	1 27
Box insect powder, for destroying dermestes, by mail	25	14
Folding butterfly net, the handiest ever made, by mail	1 60	1 42
Cyanide cans, for killing insects, express	35	24
Geologists hammer, express.		
Best steel, 1 lb, by mail 20c extra	1 00	76
" " 1½" " " 28c "	1 25	85
" " 2 " " " 38c "	1 50	1 10
" " 2½" " " 45c "	1 75	1 27
14 in. telescope with brass trimmings and leather case, by mail	2 75	1 75
Quart bottle of tanning liquor, by express	1 00	55
2 qt	2 00	1 00

SHOWY SHELLS.

All by mail postpaid.

Spondylus, thorny oyster	$2 50	$1 45
Giant white murex, 8¾x6½ in	1 25	72
" tiger cowry	45	27
" cockle	35	16
Crown shell, large	50	21
" " small	25	11
Cask shell, large	75	33
Black helmet	1 00	58
Milk strombus	35	15
Pearl snails, large	50	27
Green snails, fine	35	22
Gold-mouth	25	8
Magpie	30	14
Black-mouth strombus	15	6
Bicolored murex	15	6
Japanese eburna	25	8
Spiney venus, both valves	25	9
Quoit shells, both valves	15	6

MINERALS.

By mail postpaid.

Azurite and malachite, beautiful blue and green specimens, 1½x2 in	25	11
Copper with calcite	15	8
Catlinite, pipestone	15	6
Carborundum, 2x2 in	20	11
Calcite stalactites, fine greenish form from copper mines	15	8
Dufrenite 1x1½	15	9
Emory, 2x2 in	15	6
Graphite, 1½x2 in	20	9
Geyserite, 1½x2 in	25	9
Gold-bearing quartz, 1x1½ in	15	7
Lodestone, magnetic, 1x1½ in	15	6
Magnesite, Greece, 1½x2 in	20	9
Quartz crystals on rock, 1½x2	25	11
Rubellite, 2x2 in	35	16
Sulphur in native form, 2x2 in	20	10
Sphalerite, fine, 1x1½ in	15	7
Native tin ore, 1½x2 in	15	7
Mazon creek fossil fern in kidney shaped rock split open to show the fossil, 2 to 4 in. in length	50, 75	23, 31
Fossil leaves, like last, 1½ to 3 in	35, 75	17, 27

The "Little Gem" collection of semi-precious stones. It consists of the following, all polished and labelled, one of each: Sard, bloodstone, cats-eye, tiger eye, gold-stone, lapis-lazuli, sard-onyx, coral-agate, dendritic agate, moss agate, niccoli, chalcedony, 2 var. each; carnelian and wood agates, 3 var. black onyx agate, and one shell charm; 20 in all, amounting at regular retail price to $1 50. I will send you the whole collection postpaid for 75

CURIOS.

Mexican irridescent pottery, cups, saucers, plates, etc., by mail	$ 15	$ 10
Same, ½ doz., for only		50
Mexican banks, shaped and colored in imitation of various fruits, by mail	50	31
Fragment of prehistoric pottery from Western New York, mail	25	11
Horse-foot crab, by mail	35	16
Ressurection plant, large, by mail	25	10
Piece of Tapa cloth made by natives of South Sea Isles, strong and curiously figured	15	6
Sea pen, giant, by mail	2 50	76
" small, by mail	1 00	28
Porcupine fish, by mail	50	24
Small sand dollar, by mail	5	3
Giant brain coral, 16 in. diam., 6 in. high, very fine, express or freight	5 00	2 25
Large organ-pipe coral, 10x9 in., very fine, express	2 50	1 20
Shark teeth, by mail	10	4
" " fossil, by mail	5	2
Sea bears, ½ doz., assorted colors, by mail	20	7

MISCELLANEOUS.

Horse shoe composed of minerals and semi-precious stones, labelled, very fine, by mail	$1 25	65
Anchor like above, by mail	1 25	65
Beaded Indian awl cases, by mail	45	31
Japanese book, very curious, mail	1 00	52
Chinese horn nut, by mail	10	3
Foreign stamps, by mail	2 50	50
Souvenir spoon, bowl of cardium, handle tail of king crab, by mail	35	15
Penholder from tail of king crab, by mail	15	8

MAGAZINES, PAMPHLETS, ETC.

Nidiologist, Vol. I, No's 3, 4, 5, 7, 10, 11, each	12
Vol. II, No's 2 and 7, each	10
Vol. III, No's 1, 3, 4-5 6, 7, each	8
A. O. U. Check List, abridged edition, 1889	75 35
Government Reports, "The Prairie Ground Squirrels of the Mississippi Valley," Bailey, 1893, 67 pages	50
"N. A. Fauna No. 5," Merriam and Stejneger, 1891, 125 pages	60
"The Pocket Gophers of the U. S," Bailey, 46 pages, 1895	40
"The Common Crow of the U. S.," Barrows and Schwarz, 1895, 98pp	40
"Food and Tongues of Woodpeckers," by Beal and Lucas, 1895, 45 pages	40
"The Crow Blackbirds and Their Food," Beal, 1895, 18 pages	20
Smithsonian Reports, "Directions for Collecting Birds Eggs and Nests," Bendire, 1891, 10 pages	20
"Directions For Collecting Plants," Knowlton, 1891, 46 pages	30
"Directions For Collecting Reptiles and Batrachians," Stejneger, 1891, 14 pages	20
"Instructions for Collecting Mollusc's, etc.," Dall, 1892, 56 pages	35
The Auk, Vol. 9 and 10 each	3 00 2 20
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"Birds of Western New York," Short 1893, 13 pages	10 7

These prices are good until May 20th only. If you order at once you will get just what you want.

NATURAL SCIENCE NEWS

VOL. II. No. 12. ALBION, N. Y., APRIL 18, 1896. Whole No. 64.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

FOR SALE.—One Scotch collie pup 6 months old, one pup 2 months old, one 1 year old, registered in the H. K. C. & B.; 3 pairs of white fan pigeons. Will sell cheap or will exchange for anything useful. A. L. HYZER, Andes, N. Y.

□ PEACOCKS (live) $2.00 each; not in full plumage. Cork, grated fine for rock work, 15c per peck, any color, 20c per peck, postage 10c extra. J. J. WIRZ, Taxidermist, Augusta, Ga.

EXCHANGE.—16 gauge collecting gun with rifle barrel, cost $16—4x5 new model camera, cost $15—No. 5 autoharp, cost $20. What offers? C. H. DICKINSON, Grand Rapids, Minnesota.

TO EXCHANGE.—Clean second hand book "TomBrown at Rugby," for good offer of Indian relics or coins. F. S. BOGARDUS, Belvidere, Ill., Box 80.

SNOWY OWLS, to be sold: Live bird, quite white, sound, eats well, $5 net. Bird in meat, nearly immaculate, in perfect condition, $5 net. Bird mounted, a pure white specimen. $7 net. P. B. PEABODY, St. Vincent, Minn. O

I HAVE Shakespeare's complete works in three cloth bound volumes to exchange for A 1 sets with data. Write, make me an offer. OLIVER DANIELS, Box 454, Kalamazoo, Mich. 61-2t

To EXCHANGE.—B b Cornet, watch, stamps and finely stuffed and mounted birds and mammals, heads on shields, collections in cases. Wanted: Bicycle, medical books, surgical and taxidermist instruments. All letters answered. Address, F. S. HAGGART, Taxidermist, Chagrin Falls, O. O

I WANT AT ONCE the following A. O. U. Nos.: 5, 34, 35, 47, 76, 108, 117, 120c, 122, 123b, 172, 187, 203, 216, 226, 258, 274, 231, 288, 293, 293a, 328,355, 356, 366, 402, 408, 399, 418, 428, 434, 449, 474c, 478, 480, 482, 484, 486, 492, 537, 574, 575a, 588, 587a, 629, 630, 637, 645, 654, 662, 667, 671, 685, 686, 707a, 711, 716a, 734, 741a, 752, 768. All singles. Rare ones to be accompanied by data as to locality and collector. Sets taken where one constitutes the set. For any of these I will give good exchange in other eggs, showy shells, minerals, curios, etc. Address ERNEST H. SHORT, Albion, N. Y. O

EGG COLLECTORS, Attention.—May 15th I will issue a Special Bargain Egg Bulletin, giving full list of sets on hand and prices at which I will send them. As I wish to close out all on hand, ready for new seasons collecting, I will sell at about ¼ regular catalogue rates. All sets first-class and guaranteed. List free. Send your name on postal. List will contain about $500.00 worth. GEO. W. DIXON, Watertown, South Dakota. O

FOR EXCHANGE.—I will exchange a secret for traping foxes by scent which will call them ½ mile to the trap. The scent has to be made in April and it costs you nothing to make it, and until May 15 I will exchange the secret for $10 cash or $12 worth of such things as I can use in the line of Microscopes, Telescopes or Field Glasses, Mounted Birds, Rare Eggs, Books and U. S. Stamps. No cards answered. Address, WALTER E. McLAIN, Box 70, New Vineyard, Maine. 63-3tO

FOR SALE.—Two young foxes, just the right age to tame and handle. Can eat alone. Address JOHN HAGEN. Darien, N. Y.

WANTED.—All kinds of foreign and U. S coins, medals and fractional currency. State condition, date, face value and your lowest cash prices. RUSSELL NEVILLE, Kewanee, Ills. 64-2t

THE ALL STEEL CLIMBER. Will not break. Will climb rough or smooth bark trees and lasts a life time. Weighs under two pounds. Price with straps $1.50; without 80c. Address R. C. ALEXANDER, Plymouth, Mich.

EXCHANGE.—A fine "Irish Setter" Dog 1 year old, good blood and healthy; also 4 Retrievers 5 months old for curios of any kind. Price, $50 for setter; $10 a piece for retrievers. All hand broke, not field. Eggs and skins from this locality at all times for sale or exchange. ALF. EASTGATE, Harrisburg, Nelson Co., N. D. 64-2t

A BARGAIN for some body. A 38 cal. 7 shot Winchester rifle, for only $5. cash. A good shooter. Address N. P. BRADT, Hindsburg, Orleans Co., N. Y.

WILL SUPPLY a few birds in the meat such as Ducks, Gulls, &c. while season lasts. Skins if desired. A mounted Bald Eagle for sale, $15. WM. J. HEINZMAN, 1212 Monroe St., Sandusky, O. 63-2t

ENTIRE set of Columbian stamps, unused, including all dollar denominations, best offer in cash or otherwise wins. Scott's price $28. D. H. HAIGHT, Goshen, N. Y. 63-2t

"AUKS" Wanted.—I will allow 50c each for any back number of the "*Auk*" you may have, if in good condition and sent prepaid. You to take your full pay in Bird Skins, Eggs, Shells (showy or scientific), Corals, Echinoderms, Fossils, Minerals, Indian Relics, Curios or Novelties as listed in the Premium List Supplement. I can also use on same terms the following Numbers of the OOLOGIST at prices quoted: June, 1888, 25c; July-Aug., 1886, 15c; Jan.-Feb, 1887 or Dec., 1886 with same attached, 20c; June-Sept., 1887, 15c; Apr., 1889, 12c. All must be *complete*, *clean* and in good condition. I will also accept back No's of the *Ornithologist and Oologist* or *Nidiologist* any issue and in any quantity at 5c per copy on same terms. I can also use books on subjects pertaining to Natural History if in good condition and cheap, also A No. 1 sets of eggs with data at ½ "Standard" rates. Lists of books and eggs must be submitted for my selection or approval before sending. Address at once FRANK H. LATTIN, Albion, N. Y.

Come to Florida.

A fortune can be made in a few years in pineapples and tomatoes; vegetables raised the whole year. An ideal home. For particulars write **R. P. Osler,** Avon Park, Fla. 29&Otf

MINERALS,

Ancient Indian Relics, Stamps and Curiosities.

Price List, Postage Free.

W Perry Arnold, Stonnington, Ct.

WANTED—AN IDEA Who can think of some simple thing to patent? Protect your ideas; they may bring you wealth. Write JOHN WEDDERBURN & CO., Patent Attorneys, Washington, D. C., for their $1,800 prize offer.

COLORED PAPERS.—Something everybody needs, a package of 60 all different for only 10c. silver or stamps. N. P. BRADT, Hindsburg, Orleans Co., N. Y.

COLLECTORS Attention! Gulf Coast Eggs, Skins and Shells collected to order, cheap for *cash* only. H. E. PENDRY, Myers, Fla. ONtf

CHEAP! I will send A 1 mounted Green-winged Teals (male or female) for $1 each postpaid. I have mounted birds, skins and eggs constantly for sale "I don't use embalming process.." WM. M. BRAY, Taxidermist, Box 1453, Grinnell, Iowa. 63-2t

DEAR SIR:—I am anxious to have you see a collection of the Famous Herkimer County Crystals, hence I make you this offer: If you are a subscriber to this paper, let me send you by return mail, post-paid, 36 of these Brilliant Gems; if they please you send me 72 cents, if not satisfactory return the collection and it will be O K. Yours respectfully, A. B. CRIM. Middleville, Herkimer Co., N. Y.

OPALS, Minerals, Cut Gems and Natural History Specimens. Will buy, sell or exchange. List for stamp. ROBERT BURNHAM. 15 Chestnut St., Providence, R. I. 51-25t

"NATURAL SCIENCE NEWS," Vol. I complete. Less than ten complete vols. left. Will send you one for only $1.00. Complete your files. Will furnish Nos. 1 and 2 at 10c each. All others 5c each or in lots of five or more 4c each, or ten or more 3c each. (Nos. 1 and 2 are always 10c per copy net.) FRANK H. LATTIN, Albion, N. Y.

FOR SALE OR EXCHANGE.—Malachite, Crysocolla, Chalcedony, Quartz, Azurite, Monazite and Frankline, Microscopic slides, Infusorial earth 100 localities, Trap-tufa and rocks for sale or exchange for other minerals or Microscope slides or Infusorial earths PROF. ARTHUR M. EDWARDS, Newark, N J. O. & N. t

WANTED.—Meteorites. New and undescribed ones especially desired. Good prices paid for complete "falls" or "finds.," EDWIN E. HOWELL, 612. 17th St. N.W., Washington, D.C.

THOSE WANTING Chinese Ring-neck Pheasants (birds or eggs), deer, bear, or other Oregon birds or animals should address, MATTESON & M[illegible]SON, Pheasant Breeders, Turner, Oregon. 59-6t.

CABINETS. Send 10 cts for photo of our speciality—Self Locking. T perches—Oak samples by mail 8c, 10c and 15c; also stands, shields, glass cases, game panels, &c. Cabinets to order. HANAFORD CABINET CO., 139 and 141 W. Fulton St., Grand Rapids, Mich. 58MOtf

SCHOOL COLLECTIONS

50 Typical Rocks, 100 Important Minerals, 50 Representative Fossils,

all classified to illustrate Dana's Mineralogy and Geology; delivered freight paid, at low prices in sizes for school cabinets, teachers or students. Dana's latest work, Minerals and How to Study Them," for $1.30 postpaid. Catalogue and prices for stamp. 100,000 specimens. 11 years in this trade. L. W. STILWELL, Mineralogist, Deadwood, S. D.

When answering advertisements always mention the NATURALSCIENCE NEWS.

SURPLUS.

For the past two years I have been endeavoring to unload an enormous stock of Specimens, Curios, &c. I have retailed, wholesaled and jobbed "carloads" of them but of a few items I had such an immense stock left on hand that no single dealer cared to shoulder the entire lay out, and since my large sale of stock and retail business to Mr. Short, a year ago, I've been unloading this "surplus" at Chautauqua, Lakeside, Fairs, Atlanta and through Premium Offers and Xmas Presents. I find, however, that I still have a "surplus" and that I'm apt to have one at the end of this season's campaign, but in order to avoid its being a large one I have concluded to offer the following during the months of April and May, after which I shall be busily engaged with my Resort Trade.

If you are "short" of CASH I can use *good* endorsed bankable paper or would even exchange for desirable sets of eggs, valuable U. S. and Department stamps or for anything in my "Want" ad. in NATURAL SCIENCE NEWS of February 29th or for anything in my line suitable to retail from my Chautauqua stores.

WHY DON'T YOU GET A "STARTER" TOWARDS A RETAIL, RESORT, FAIR OR EXCHANGE STOCK?

Small orders for single specimens will be filled at first column prices only, at which they are sent by mail or express prepaid. All prices given per 10 and per 100 are by express or freight at purchasers expense

Five can be selected at 10 prices; 50 at 100.

For $1.00 you can select anything on the list, at single rates, to the amount of $1.00 and I will send them to you prepaid and include a years subscription to either the OOLOGIST or NATURAL SCIENCE NEWS

$5.00. On an order amounting to $5.00 or over you can select *single* specimens of anything on the list at 10 rates.

$10.00. On an order of $10.00 you can select *single* specimens of any thing on the list at 100 rates.

By sending a $5 or $10 or you can get specimens at about ¼ usual prices, and at prices, on many things at least, which cannot be duplicated by purchasing in large quantities elsewhere.

If there is anything on the list that you can use I want to sell it to you even if that item amounts to only a few cents. If you find that you can use $25, $50 or $100 worth send me your list for inspection and I may be able to shade even these ridiculously low prices. The gist of the whole matter amounts to this: If I can convert this "surplus" into cash or stock which I can turn into cash during the next six months I'll not let any reasonable proposition pass by even if at a considerable loss to myself.

The stock I offer is A No. 1. Staple and saleable but I am overstocked. Let me hear from you. Address

FRANK H. LATTIN, Albion, N. Y.

MINERALS AND FOSSILS.

	Each	Per 10	Per 100
Scaphites nodosus, No. 1, small	10	50	3 00
" " " 2, medium	25	75	5 00
" " " 3, medium	50	1 25	10 00
" " " 4, largest	1 00	3 00	25 00
Geodes, selected, 3 in	50	2 00	15 00
" chalcedony, Black Hills	25	1 50	12 50
Fossil Polyp Coral, small	5	30	2 00
" " " medium	10	40	3 00
" " " large	25	75	5 00
Flexible Sandstone, per lb	50	1 50	10 00
Coquina, per lb	35	75	5 00
Electric Stone, per lb	50	2 00	12 50
Gypsum, per lb	30	50	3 00
Fossil Shark Teeth	5	20	1 00
" " " selects	10	30	2 50
Students Mineral Collections, 50 selected 1½ in. spec'ns	1 50	10 00	80 00
100 Specimen Mineral Collections, extra fine, specimens			
In this collection have a retail value of 5 and 10c each	3 50	25 00	200 00
GEM STONES, small cut and polished semi-precious stones, many suitable for mounting			
Sard Trilby heart Intaglioes	15	1 00	7 50
Opals, Mexican	25	1 50	10 00
" "	50	3 00	20 00
Red Onyx	15	1 00	7 50
Black Onyx	15	1 00	7 50
Crocidolite, Tiger-eye	10	60	4 00
" " medium	15	1 00	7 50
" " select	25	1 50	10 00
Lapis Lazuli	35	2 00	15 00
Chalcedony, tinted	10	75	5 00
" varigated	10	75	5 00
" showing an artificial tree	15	1 00	7 50
Black Ribbon Agates	10	75	5 00
Red Ribbon Agate	10	75	5 00
Carnelian	10	75	5 00
Assorted, all the above and many others	10	75	5 00
Ditto, selects	15	1 00	7 50

MEXICAN IRIDESCENT WARE.

The following is from an article on Mexico, by Charles Dudley Warner in *Harper's Magazine*: "At Patzcuaro we found by chance, for it was not displayed for sale, something that interested us more than anything else made in Mexico. This was a true iridescent ware. The specimens we obtained were small, round and rectangular plates. The lustre is the true Saracenic, Alhambra, or Gubbio lustre, the real iridescence, shimmering, shifting colors in changing light, ruby, green, blue. Would it not be strange if this lost art were preserved in Mexico? The ware is rude. The makers have not the certainty of producing a particular color in a picture which distinguishes a Gubbio work, and it lacks the elegance and glaze, the solidity and fineness of the Alhambra tiles. But it is a genuine iridescence. The plates are exceedingly thin and brittle. The lustre seems to be metallic, of copper, and the effect produced by subjecting the ware to an exceedingly high temperature, a firing so fierce that the clay is apparently disintegrated, and has lost its ringing quality." The ware is very difficult to procure and ours is one of the first lots sent to the U. S. The small pieces are mostly in plaques and round or oblong dishes, small vases, baskets, bowls, kettles, etc. Most of the flat pieces have holes in one edge to hang up as plaques, but can be used equally well for card receivers, cigar ash receivers, jewel cases, etc.

Small pieces of Iridescent Ware, assorted	15	1 00	7 50
Pulque Cups of Iridescent Ware	35	2 00	15 00
" " " " large	75	4 00	30 00
Sugar Bowls " " "	75	4 00	30 00

SHELLS.

	Each.	Per 10.	Per 100.
Peanut or Rope Shells	$ 03	$ 10	$ 50
Blued Cowry	25	75	5 00
Black Ear, small, rough	15	20	2 00
" " medium, rough	35	75	5 00
Scallops, *Pecten irradians*, dark valves	03	10	50
" " " light valves	05	25	2 00
Poached Egg Shells	25	75	5 00
Scallops—small white valves for fancy work	03	20	1 50
Snipe-billed Murex	50	2 00	15 00
Strombus alatus, selects	15	60	4 00
" " ordinary	10	40	2 00
Goldmouths	15	75	5 00
Spider Shells	35	75	5 00
Cask Shells *Malea ringens*	75	3 50	25 00
Lettered Olive or Key Shells, small	05	20	1 00
" " " " medium	15	35	2 00
" " " " large	15	50	3 00
Japanese Eburnas	15	75	5 00
Lord's Prayer Cowries	35	2 00	17 50
Money Cowries	05	20	1 00
Mammoth Japanese Unio Valves	50	1 50	10 00
African Murex	75	3 00	20 00
Milk Strombus	35	1 00	7 50
Magpies, small	05	30	2 00
" medium	10	50	3 00
" large	25	75	5 00
Pearl Trochus	25	1 25	10 00
Paper Shells, *Sycotypus papyratia*	20	50	3 00
Marlin Spikes	25	1 00	8 00
Pink Murex	35	1 50	7 50
Rock Murex	25	75	5 00
Cardium, valves	15	30	2 00
African Murex, 2ds	25	50	3 00
Fox heads, small	25	75	5 00
" " 2ds	15	50	3 00
" large	35	1 25	10 00
White Murex, 2ds	15	60	4 00
Fulgur perversa, 10-12 in	75	1 50	10 00
Giant Fasciolarias 12-18 in	1 00	3 50	25 00
Kid Conchs	15	75	5 00
Camel Shells, *Ovulum gibbosum*	10	50	3 00
Angel wings, pairs, small	25	75	5 00
" " " large	75	3 50	25 00
Cardium isocardias	15	50	3 00
Orthalicus melanochilus	25	75	5 00
Liguus fasciata	15	50	3 00
Chama arcinella	20	75	5 00
Bleeding Teeth, selects, small	03	20	1 00
" " medium	05	30	2 00
" " large	10	60	5 00
Leaf-backed Murex, small	05	30	2 00
" " medium	10	50	3 00
" " large	15	75	5 00
Thorny-nosed " small	05	25	1 00
" " large	10	50	3 50
Bahama "	10	30	2 00
Silver lips	15	30	2 00
Dotted Cones	15	40	3 00
Dove Shells, from British Guiana exhibit at World's Fair	03	10	50
Wheel Shells, *Rotella*	03	20	1 00
Keyhole Limpets	10	30	2 00
Helix fideles, Oregon	25	75	5 00
Wampum or Tusk Shells	05	20	1 00
Little Agate Shells, *Achatinella*	10	50	2 00
Partula gibba, Ladrones	10	30	2 00
Pythea pyramidata	10	30	2 00
Quoit Shells, 1 valve, *Dosina*	10	30	2 00
Australian Jewel Shells, 1-valve, *Trigonia*	15	60	5 00

LAND AND MARINE CURIOS.

	Each.	Per 10.	Per 100.
Eggs of Hammerhead Shark, selects	15	1 00	7 50
" " " seconds	10	40	3 00
Hermit Crab in Shell	35	1 25	10 00
Black Starfish, *Echinaster sentus*	35	2 00	15 00
Liver Beans	10	30	2 00
Yellow Sea Beans	03	10	50
Red " "	03	10	50
Black " "	03	10	50
Brown-banded Sea Beans	05	20	1 00
Rose Coral	15	50	3 00
Honey Comb Coral	25	75	6 00
East Indian Branch Coral	03	10	50
" " " "	05	20	1 00
" " " "	10	40	3 00
" " " "	25	1 00	8 00
Egg Cases of Periwinkle	25	1 00	7 50
Tarpon Scales	05	20	1 00
Acorn Barnacles	10	50	4 00
Skate or Sand Shark Eggs	05	20	1 00
Small Porcupine Fish	35	1 50	12 50
W. I. Spike Coral	03	10	50
" " "	05	20	1 00
" " "	10	40	3 00
Organpipe "	05	20	1 00
" "	10	40	3 00
" "	25	1 00	8 00
" "	50	2 00	15 00
Resurrection Plants	15	75	6 00
Sea Fans, small	15	50	3 00
" medium	25	75	5 00
" large	35	1 00	7 50
Sea Ferns, small	25	75	5 00
" medium	50	1 25	10 00
" large	75	2 00	15 00
Florida Gorgonias, assorted	25	1 00	7 50
Tarantulas mounted in box	60	3 00	25 00
Scorpions " "	40	2 00	17 00
Trap-Door Spiders " "	50	2 50	20 00
" " nests	30	1 50	12 00
" " " in boxes	60	3 00	25 00
" " " Redwood pails	55	3 00	25 00

Continued on next ad. page.

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Post Prandial Pot-pourri.

DEAR MR. EDITOR:—Appreciating the fact that in most of the scientific articles of the present day, the great (I am) and little (me too) enter too largely into the substance, the writer of the following alliterating lines has shown that sense and science may be offered without a single pronoun, personal or otherwise.

As will be seen, the following article is largely scientific, and while it refers to Botany, Birds and Fishes, also relates to Pedagogy, Philosophy, and Pugilism, and is further embellished with a *Fin de siecle* love story.

Truly Yours, G. S.

Peter Pettigrew, person, Podunk, Pennsylvania, possessed Priscilla, Pandora, Phyllis, Patience, Polhymnia, Prudence.

Pleasing Patience peeled potatoes; pared pippins, prepared purre, pie-plant pies, parsnip poure, pungent pot-pourri; patched parasols; pressed pantaloons, parti-patterned petticoats. Patience possessed peculiar predilections.

Pleasant, pacific Prudence produced purple passamentarie, princely pourpoints, pourlaines. Prudence possessed poetic propensities; penned paracrastic poems; preferred pentametric parodies.

Pretty, pensive Phyllis preserved peaches, pomegranates, pumpkins, persimmons, pineapples; picked peppers; pitted prunelles; picked pecans, pawpaws. Phyllis positively proved preternaturally providential.

Paradorical, penetrating, philharmonic Polhymnia, phrenological prestidigitateur, palmistry, phrenology; possessed philomnisical propensities, pronouncedly paradisaic. Polhymnia performed pedagogical prodigies.

Popular, passive Priscilla planted petunias, pæonies, pelargoniums, pansies, polemoniums, potentillas, portulacas; proscribing phenogamous pyramidals; preferring procumbent, pdyandrus, polypetalous, pubescent perennials.

Preoccupied, prurient Pandora, proverbially prophetic, pursued psychology, palæology, palæontology, penology, phonetics, peizometry; prepared peculiar phosphoroscopic phenomena.

Pittsburg, Pennsylvania possesses philosophers, politicians, pharmacists, puritans, pugilists, peddlers.

Parson Pettigrew provided plentifully; possessed potential, parental propensities; palpable preciseness; pondered paternally periodically; perhaps premeditated presumptively. Pater-familas, possibly perceiving poverty, privately, precursorially proceeded; pathetically pleading: 'pre-eminently precious posterity, presupposing providential proposals, primordially promise positively. Provoking procrastination produces personal punishment, perchance proving peculiarly parnicious.'

Prosaic, peripatetic, prevaricating Philetus Peterson, principally peddled Peterkin's Panacea, pillules, pancreatin, prickly-pear potions, pennyroyal, podophyllin pellets; provided pleuritic plasters.

Petulent, piratical, pusillainmous, pugilistic Philander Palmer pummeled putative pugilistic promiscuously, practiced plestrical pastimes, pteriplegistic pursuits; played penny-ante; plunged profoundly; punished poorly prepared players; proffered plutonic pleasures; plundered puerile personages; pillaged philanthropic people.

Pertinacious Phillip Pyrrhus, Philadelphian previously, pharmacist, promulated pharmacodynamics; purified permanganate potash; prepared paraldehyd, perfumeries, paregoric, ptomain preventives, psychtics, peptogenic preparations, presumably pleasing pharmaceutists, physicians, pharmacologists, principally pharmacopolists.

Profound, pansophical, pedantic Paulus Pericles, panegyrist, prothonotary, philosophised prodigiously, preferring physicological prosyllogisms, psychopannichismic problems. Pericles pre-conceived precarious pseudongyms; pre-established patrongymics; plausibly precipitated pandemonium progmatically; provided pioneers prairies; pitifully plundered plaintiff's plethoric pant's-pockets.

Parsimonious, pachydermatous, puritaincal, phlegmatic Patrick Polybidas passed prolonged periods patiently pondering; prayed powerfully; penned prohibitionary pasquinades; puffed prohibitory passages; profaned paparchy profusely.

Plebian, pagan Petruchio Phisander, polemic philosophiser, professed pantheism; proscribing predestination, parthenogenesis; purporting pessamism; presupposing platonism (parenthetically); plagiarizing patrician piety purity.

Phineas Paddington, painter, painted portentious paradoxical phantasmical panoramas, principally presenting piscine pastimes. Phineas practiced piscatorial pleasures; pursued pisciculture; pleasing pastimes, poorly productive pecuninarily. Phineas possessed piscivorous peculiarities, preferring puffers pilchards, *pimelodus*, protesting pike-perch, pompanos, pickerel.

Phineas presented Parson Pettigrew's people partridges, pickerel, paintings. Polhymnia's papa possessing piscivorous preferences, perdivorous proclivities, presumably permitted Phineas's presumptive presentations. Phineas persisted, propitiated Polhymnia; playfully proposed. Polhymina promised.

Prosaic pill-peddling Philetus proposed, pinching peach-painting Patience. Peterson's peculiar propensities precluded possible peaceable procedures. Patience placidly, *proh pudor.*' Philetus pensively—'*præmonitus præmunitus.*' Patience prevented powerful prejudice; promised.

Pugilist Phi'ander presupposing prior proposals preposterous, poring proudly, proclaimed preferment. Philander possessed potential philogynic propensities. Patience positively precluded possibilities.

Pharmacologist Pyrrhus pleased peaceful Prudence; penned poetic prescriptions; proffered perfumeries, pomades. Phillip proved per-

sistent. Prudence precipitated proceedings, possibly perceiving proposals. Pyrrhus professed. Prudence purred, puttered, propounded problems, puzzles. Pyrrhus's powerful, passionate pleadings prevailed. Prudence, pensive, poutingly promised.

Parsimonious Polybidas prayed Phyllis's papa's permission. Parson Pettigrew permitted Polybidas's preferment. Polybidas preached post-prandially, prayed Phyllis's pardon; proposed primitively. Phyllis promised, professing profound passion.

Pagan Philsander preferred Priscilla, puting, pampered plebeian. Punctilious Priscilla proscribed Philsander, providentially proclaiming pessimists positively provoking profligates. Philsander purloined poison, partook; purgatory.

Pedantic Paricles panegyrized Pandora, proposing partnership; prognosticating prominent public position; promising parliament. Pericles prevailed. Pandora pronouncing, 'Parcæ permitting.

Pleasing peculiar Pennsylvanians, pleasantly portrayed.

GOSLOW SIMON,
Pernambuco, Patigonia.

The Alligator or "Gator."

(*Alligator mississipiensis.*)

The common alligator is pleantifully found in Florida, and Mississippi, the lakes and rivers of Louisiana and Carolina and similar localities. It is a fierce and dangerous reptile, in many of its habits bearing a close resemblance to the crocodile, and the other members of the family.

Unlike the crocodile, however, it avoids the salt water and is but seldom seen even near the mouths of rivers where the tide gives a brackish taste to the waters. It is mostly a fisheater, haunting those portions of the rivers where its prey most abounds, and catching them by diving under a passing shoal, snapping up one or two victims as it passes through them, tossing them in the air for the purpose of ejecting the water which has necessarily filled its mouth, catching them adroitly as they fall, and then swallowing them.

Though timid, as are most reptiles as long as their passions are not touched, the alligator has within it a very mine of furious rage, which, when aroused, knows no fear. Urged by a blind instinct that sees no obstacle, and hardly deserves so intelligent a name as anger it flings itself upon the assailants, and only ceases its attack as its last breath is drawn.

It is no easy matter to drive the breath out of an alligator, for its life seems to take a separate hold of every fibre in the creatures body, and though pierced through and through with bullets, crushed by heavy blows, and its body converted into a very pin-cushion, spears taking the place of pins, it writhes and twists, and struggles with wondering strength, snapping direfully with its huge jaws, and lashing its muscular tail from side to side with such vigor that it takes a bold man to venture within range of that terrible weapon.

It is fortunate that its head is not gifted with mobility equal to that of the tail. The alligator can only turn its head very slightly, on account of two bony projections, one on each side of the head, which are efficient obstacles to any but the smallest lateral motion. The antagonist may therefore easily escape if on land by springing aside before the reptile can turn. He must however, beware of its tail, for the alligator when angry sweeps right and left with that powerful member, and deals the most destructive blows with wonderful rapidity. Still the creature would rather avoid than seek a combat, and does not act in this manner untill driven to desperation.

Alligators are sometimes caught in a peculiar way. An ordinary line is of very little use as its sharp teeth can cut it in less time than it takes to write. Therefore an alligator line is made of several thickness of fishlines, each part separate.

When an alligator finds a hook down its throat it tries to bite the fishline which it cannot do as the different strands get caught in its teeth.

The eggs of the alligator are small and numerous. The parent deposits them in the sand of the river side, scratching a hole with her paws, and placing the eggs in a regular layer therein. She then scrapes sand, dry leaves, grass and mud over them, smooths it, and deposits a second layer upon them which are covered over in like manner until she has fifty or sixty eggs. Although they are hatched by the heat of the sun and the decaying vegetable matter, the mother does not desert her young, but leads them to the water and takes care of them until they are able to take care of themselves.

The young are terribly persecuted by birds and beasts, and are even in danger of being eaten by old males of its own species. During the winter months the alligator buries itself in the mud, but a very little warmth is sufficient to make it quit its retreat and come into open air again.

It sometimes attains a great size though its size is usually six or seven feet; specimens have been found measuring twice that length.

A live specimen at Central Park, New York, is twelve feet.

The alligator race threatens to soon become extinct, the same as its northern friend, the seal. At one time alligator skins were sold at from $25 to $100 but a recent item in a local paper says that $2.50 is the average price paid now. Notwithstanding this a firm in Florida has an annual business of $60,000 in that line. Fully 59,000 'gators are killed every year and unless the legislature puts a stop to it, they will be, in a few years, only seen in museums.

The term alligator is a corruption of the Spanish *el largarto* e i a lizard. Five species are known in various parts of the world, the Jacare or Yacare (*Jacare sclerops*) being one of them.

The reptile found in the tropical parts of America is not an alligator but a crocodile.. The first comparison with the alligator does not impress one with any considerable sense of difference, but the difference in breadth of the heads, when viewed from above, is very striking.

That of the crocodile is like its Nile brother, extremely narrow while that of the alligator is heavy, and very wide. The entire "build" of the crocodile is manifestly favorable to a maritime existence, while that of the alligator is for just such a life as it leads, one of sluggishness and inactivity.

S. A. PILLSBURY.

A Day Afield with Two Texan Conchologists.

I will give your readers a short description of a day's outing enjoyed by Mr. H. G. Askew and myself one day last April. We left the city of Austin at 5:30 a. m. and arrived at New Braunfels, Comal county at 7:30. After refreshments with well filled lunch baskets and many empty collecting boxes, we started up the beautiful Comal Creek on the east side working both the creek and valley near the creek, about half way from town to the head spring we crossed to the west side and worked the

hillside and ridge until we arrived at the head spring of the Comal Creek. From here we struck across the country towards the Guadalupe River, crossing and working down said river to the railroad bridge, crossing which we worked back to town. This is one of the most beautiful and fertile valleys in this or any other state, bounded on the west by a high mountain ridge covered with evergreen trees; the springs burst from the foot of this ridge and flows along southward for about two miles when it turns to the east and flows by the town of New Braunfels, furnishing a bountiful supply of the purest water for the town; power to run a large flour mill, oil mill, electric light plant, to the Guadalupe River. From the top of this ridge, the scene is most beautiful and one well worth a long trip and tiresome climb, to enjoy; the bold running stream, clear as crystal, filled with aquatic plants and vegetation, among which numerous sun perch and bass are swimming, meanders through the valley to the Guadalupe River, whose wanderings can be traced in the distance by the timber. The thrifty little town of New Braunfels, near the middle of the valley, the farm houses scattered all over the valley, makes up a scene long to be remembered. Following are the shells we found.

Goniobasis comalensis, Pilsby.
" pleuristriata, Say.
Helix auriformis, Bld.
" dorfiuelliana, Lea.
" texasiana, Mor.
" monodon, Rack.
" Mooreanf, W. G. Birm.
" griseola, Pfr.
" roerneri, Pfr.
" hippocrepis, Pfr.
Holospira goldfussi, Mke.
Macroceramus gossei, Pfr.
Physa heteaostiopha, Say.
" halei, Lea.
Bulimulus schiedianuss, Pfr.
" dialbatus, Say.
Unio undalatus, Barnes.
" aurcus, Lea.
" auodentoides, Lea.
" laticostatus, Lea.
" tuberculatus, Barries.
" Mitchelli, Simpson.
Zonites minusculus, Birris.
Glaudina decussata, Desh.
Succinea avara, Say.
Planorbis leutus, Say.
Planorbis liebmani, D. Ke.
Segmentina arenijera, Say.
Unio bulandieri, Lea.
" *purpuratus*, Lam.
" *acevcianus*, Lea.

J. D. MITCHELL,
Victoria, Texas.

BIRDS OF WESTERN NEW YORK.

ERNEST H. SHORT.

172a. HUTCHIN'S GOOSE. *Branta canadensis hutchinsii.* Probably more common than generally supposed. Migrating in company with the Canada Goose. Mr. Newell Beckwith, of Gaines, Orleans Co., has a specimen taken there about 1888.

□180. WHISTLING SWAN. *Olor columbianus.* Rare Migrant. One taken near Medina, Orleans Co., in the spring of 1886.

Order HERODIONES. Herons, Ibisis, etc.

Family IBIDIDÆ.—Ibises.

186. GLOSSY IBIS. *Plegadis autumnalis.* A rare straggler. One taken in Tonawanda Swamp and brought to Mr. George H. Hedley of Medina.

Family ARDEIDÆ.—Herons.

190. AMERICRN BITTERN. *Botaurus letiginosus.* Summer resident. Breeding in suitable marshes.

191. LEAST BITTERN. *Ardetta exilis.* Summer resident. Breeds.

194. GREAT BLUE HERON. *Ardea herodias.* Summer resident. There are several breeding places where these birds colonize, especially in Tonawanda Swamp.

196. AMERICAN EGRET. *Ardea egretta.* Rare straggler. Two specimens reported from Olcott and one from Medina.

201. GREEN HERON. *Ardea virescens.* Summer resident. Breeds.

202. BLACK-CROWNED NIGHT HERON. *Nyctocorax nyctocorax nævius.* Rare straggler.

Order PALUDICOLÆ. Cranes, Rails, etc.

Family RALLIDÆ.—Rails, Gallinules, etc.

212. VIRGINIA RAIL. *Rallus virginianus.* Summer resident. Breeds.

214. SORA. *Porzana carolina.* Summer resident. Breeds.

215. YELLOW RAIL. *Porzana noveboracensis.* Very rare. One reported by G. F. Guelf and A. H. Davis as taken near Brockport. Also taken near Murray, Orleans Co., by C. Cliff.

219. FLORIDA GALLINULE. *Gallinula galeata.* Summer resident. Breeds.

221. AMERICAN COOT. *Fulica americana.* Common migrant. Probably breeds.

Order LIMICOLÆ. Shore Birds.

Family SCOLOPACIDÆ.—Snipes, Sandpipers, etc.

228. AMERICAN WOODCOCK. *Philohela minor.* Common summer resident and breeder.

230. WILSON'S SNIPE. *Gallinago delicata.* Migrant. Common in some localities.

239. PECTORAL SANDPIPER. *Tringa maculata.* A rare migrant; reported by Mr. Davison.

242. LEAST SANDPIPER. *Tringa minutilla.* Migrant. Most common in the fall.

246. SEMIPALMATED SANDPIPER. *Ereunetes pusillus.* Occasional migrant.

248. Sanderling. *Calidris arenaria.* Occasional migrant on the lake shore.

254. Greater Yellow-legs. *Totanus melanoleucus.* Common migrant. Solitary in its habits during migration.

255. Yellow-legs. *Totanus flavipes.* Migrant not as common as last.

256. Solitary Sandpiper. *Totanus solitarius.* Rare migrant. One shot at Chili, Monroe Co., in May, 1889.

261. Bartramian Sandpiper. *Bartramia longicauda.* Migrant and *rare* breeder. Found an old bird and four newly hatched young in the latter part of June, 1890.

262. Buff-breasted Sandpiper- *Tryngites subruficollis.* A very rare migrant. Davison reports one found among Golden Plover at Lockport.

263. Spotted Sandpiper. *Actitis macularia.* Common summer resident and breeder.

265. Hudsonian Curlew. *Numenius hudsonicus.* A rare migrant. Usually with Plover.

266. Eskimo Curlew. *Numenius borealis.* Like the last, a rare migraut with Plover in the fall. Mr. Davison reports a specimen secured by F. H. Hill of Lockport while shooting Plover.

Family CHARADRIIDÆ.—Plovers.

270. Black-bellied Plover. *Charadrius squatarola.* Migrant. Not as common as next.

272. American Golden Plover. *Charadrius dominicus.* Common migrant.

273. Killdeer. *Ægialitis vocifera.* Common summer resident and breeder.

274. Semipalmated Plover. *Ægialitis semipalmata.* Occasional migrant.

Family AMPHRIZIDÆ.—Surf Birds and Turnstones.

283. Turnstone. *Arenaria intrepres.* Migrant on the lake shore.

Order GALLINÆ. Gallinaceous Birds.

Family TETRAONIDÆ.—Grouses, Partridges and Quails.

289. Bobwhite. *Colinus virginianus.* Resident. Breeds. Not as common as formerly.

300. Ruffed Grouse. *Bonasa umbellus.* Common resident in heavy timber, becoming scarce as you approach the cities and large towns. Breeds.

Order COLUMÆ. Pigeons.

Family COLUMBIDÆ.—Pigeons.

315. Passenger Pigeon. *Ectopistes migratorius.* Migrant and very rare summer resident. Breeding in some localities.

316. Mourning Dove. *Zenaidura macroura.* Common summer resident. Breeds.

[TO BE CONTINUED.]

Nature's Museum.

There are a great many people who dislike to go out into the country, for, they say, there is nothing new to be seen there; to them it is always the same uninteresting picture; they would prefer to take a walk along the busy streets of a large city, where they can look into the shop windows, and constantly find something new to interest and amuse them. But you will find that the people who make these, and similiar remarks, have no acquaintance whatever with Nature. A flashy and showy woman at first seems exceedingly pretty and attractive, but upon acquaintance it is discovered that her charms are not what they at first seemed to be. It is the retiring, modest woman who improves upon acquaintance, and the more we learn of her character the more beautiful she appears to us. It is the same with Nature. At first she seems plain and uninteresting, but the better we know her, the more we appreciate her charms.

It is not necessary that a person should have a large collection of Natural History objects to know Nature, and enjoy the country; nor is it necessary to take up the study of any particular branch of Natural History to enjoy country life. Tne main thing is to have the eyes and ears open, and interesting objects will soon show themselves that never before were seen.

I once went out into the country to gather mushrooms with a man who made mushrooms his hobby. Although I had my eyes wide open for them, he would pick them up from under my feet, and from off the tree against which I was leaning, while I had difficulty in finding any, Since that I have kept my eyes open for mushrooms, as well as other objects, and have found many beautiful and interesting forms I never before dreamed existed.

The country is the greatest Natural History museum we can find.

If you wish to know Nature, take frequent walks to the country, with a large opera glass in one hand and a magnifying glass in the other; with your eyes open for new sights, and your ears alert for every sound. You will then enjoy your walks and improve your mind as well as your health.

W. S. Johnson,
Boonville, N. Y.

"Eye Stones"	10	40	3 00
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Five specimen collections consisting of a selected specimen of each Tarantula, Trap-Door Spider, Scorpion. HornedToad and Centipede elegantly mounted in box	2 50	15 00	125 00
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" " " 3¼ " " "	25	1 25	9 00
" " " 4 " " "	35	1 75	15 00
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Rod of Royal Ponciana	15	60	5 00
Chinese Horn Nuts	10	30	2 00
" Brass Cash, Coins	05	30	2 00
Broken Bank Bills	10	60	5 00
Chameleon in Alcohol	25	1 00	8 00
Revolutionary Gun Flints	15	80	7 50
Arrowheads, assorted	05	30	2 00
" "	10	60	5 00
" "	25	1 50	12 00
Set of 6 var., 1c-50c unused 1880 Venzuela Stamps	15	75	5 00
Approval Sheet of 25 selected 1c stamps	20	75	5 00
" " " " " 2c "	35	1 50	10 00
Young Naturalists' Marvelous collection, containing nearly 50 labeled specimens	75	5 00	35 00
Oregon Bird Arrow Points	25	1 50	10 00
" " " "	50	3 00	20 00

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	Each.	Per 10	Per 100.
Mexican Onyx Palettes with Indian Feather Work	1 00	7 50	60 00
Mexican Purses made from the fibre of the Spanish Bayonet	35	1 50	10 00
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Mexican Pottery Fruit Banks novel and curious	50	2 00	15 00

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	Each	Per 10	Per 100
Catapult or Snip Snap Gun frames, heavy iron	$ 15	$ 40	$ 3 00
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" Brooches	50	2 00	18 00
" Watch Charms	35	2 00	15 00
Brazilian Beetle Stick Pins	35	2 00	15 00
Herkimer Co. Rock Crystal Stick Pins, sterling silver mounting	75	3 00	25 00
Flag Stick Pins	10	60	5 00
Bone Penholders	15	75	6 00
Olive Wood Penholders	15	60	5 00
Aluminum Penholders	15	40	3 00
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King Crab Tail Pendolder, new, unique	15	75	6 00
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" Purses	25	1 50	13 50
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" Snips	50	2 00	17 50
Florida Palmetto Fans, fancy	35	1 75	15 00
White Metal Doll Carriages	50	1 75	15 00

New York Central

And Hudson River Railroad.

WESTWARD.

Stations.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M
Rochester			8:00	10:30	2:20	5:35	10:00
Albion		7 00	9:10	11:35	3:25	6:50	11:06
Lockport		8:05	10:05	12:22	4:20	7:40	12:00
Susp. Bridge		8:45	10:45	1:00	5:05	8:20	12:35
Niagara Falls		9:06	10:50	1:10	5:10	8:30	12:45
Buffalo		8:55	10:55	1:25	5:15	8:45	

EASTWARD.

Buffalo		6:25		11:00	1.30	5.00	5.5
Niagara Falls		6:35	8.05	11:18	1:40		6 00
Susp. Bridge		6:45	8:10	11:25	1.48		6:00
Lockport	6:00	7:25	8:50	12:00	2:25	5:55	6:4
Albion	6:50	8:15		1:00	3:25	6:45	7:50
Rochester	8:00	9:20		2:05	4:35		9:00

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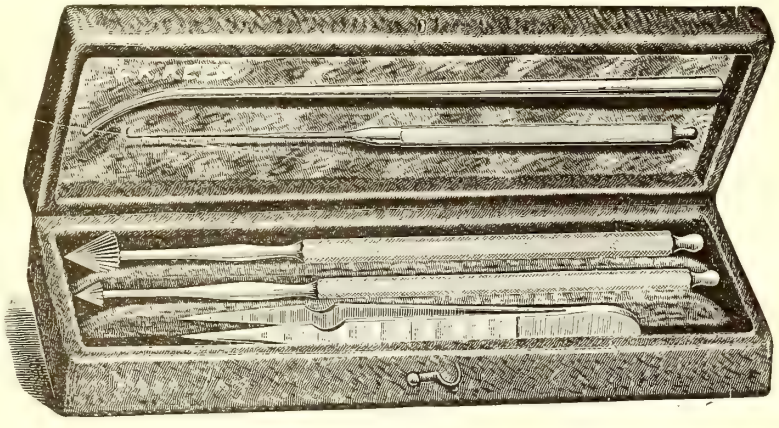

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*Black Guillemot	$ 25	$ 06
American Herring Gull	20	04
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*Louisiana Heron	12	03
Little Blue Heron	10	02
*White Ibis	25	04
Leaches Petrel	20	04
Black Tern	12	03
*American Woodcock	1 25	25
*Sooty Grouse	85	20
Valley Partridge	15	03
*Ruffed Grouse	15	04
*Purple Gallinule	25	06
Virginia Rail	20	04
Spotted Sandpiper	15	03
Prairie Sharp-tailed Grouse (poor)	50	05
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Florida Red-shouldered Hawk	65	15
*Short-eared Owl (Am.)	1 50	35
*Florida Barred Owl	1 25	35
Scarlet Tanager	25	04
Bobolink	25	05
Rose-breasted Grosbeak	10	02
Cassin's Kingbird	25	05
*Starling	15	04
*Meadowlark	10	02
*Downy Woodpecker	20	05
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Wood Pewee	12	02
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Collection of 15 varieties, all different for only		25

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Plate shell	15	06
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Scylomus turrinellus	45	20
Spotted cassis	35	10
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Purple Sea-snail, small	10	03
Purple Sea-snail, large	45	20
Spiral Shell	15	05
Paper Sailor	1 50	1 00
Little Dolphin	1 50	75
Calf Cowry	10	03
Lynx Cowry	10	03
King Cowry	05	01
Arabian Cowry	15	05
Carneola Cowry	15	06
Screw Shell	35	08
Mammoth Scallop	70	11
Razor shell, large	25	09
Razor shell, small	15	05
Harp shell	35	22
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Oregon Snail	15	04
Black-mouthed Snail	25	11
German Land Snail	35	14
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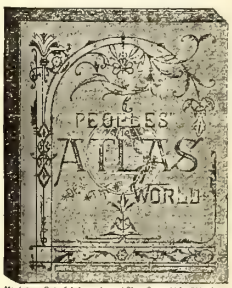

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NATURAL SCIENCE NEWS

VOL. II. No. 13. ALBION, N. Y., APRIL 25, 1896. Whole No. 65.

Wants, Exchanges, and For Sales.

Brief special announcements, "Wants," "Exchanges," "For Sales," inserted in this department for 25c per 35 words. Notices over 35 words charged at the rate of one-half cent per each additional word. No notice inserted for less than 25c. Terms, cash with order.

All copy must reach us at least *three* days prior to date of issue in order to insure insertion in any given number.

FOR EXCHANGE.—I will exchange a secret for traping foxes by scent which will call them ½ mile to the trap. The scent has to be made in April and it costs you nothing to make it, and until May 15 I will exchange the secret for $10 cash or $12 worth of such things as I can use in the line of Microscopes, Telescopes or Field Glasses, Mounted Birds, Rare Eggs, Books and U. S. Stamps. No cards answered. Address, WALTER E. McLAIN, Box 70, New Vineyard, Maine. 63-3tO

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Rochester.....		8:00	10:30	2:20	5:35	10:00	
Albion	7:00	9:10	11:35	3:25	6:50	11:06	
Lockport.....	8:05	10:05	12:22	4:20	7:40	12:00	
Susp. Bridge ..	8:45	10:45	1:00	5:05	8:20	12:35	
Niagara Falls.	9:06	10:50	1:10	5:10	8:30	12:45	
Buffalo.....	8:55	10:55	1:25	5:15	8:45		

EASTWARD.

Buffalo.....	6:25		11:00	1:30	5:00	5.5(	
Niagara Falls.	6:35	8:05	11:18	1:40		6:00	
Susp. Bridge .	6:45	8:10	11:25	1:48		6:05	
Lockport.....6:00	7:25	8:50	12:00	2:25	5:55	6:45	
Albion..... ....6:50	8:15		1:00	3:25	6:45	7:50	
Rochester.....8:00	9:20		2:05	4:35		9:00	

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A Sketch of the Life History of Papilio Asterias. *

One of the most beautiful and interesting of Natural Science studies is Entomology, and one of the most interesting special studies in this is the order of Lepidoptera.

Again one of the most pleasant pastimes in this study as well as a valuable means of personal investigation and observation is the breeding of the perfect insect from the egg or larvæ.

During the past summer I found time in my other duties to confine a few of the yellow and black "worms" found on the caraway plant, and brought under closer observation the well known process of transformation and also the less known fact of the parasitical operation of *Trogus epssorius.* Brulle on this species.

P. asterias. Drurg., appears in New England and the middle states in June where it lays its eggs on the leaves of the caraway, parsley and plants of like order. From the brood thus hatched another set of butterflies appear in August. Thus says Packard's "Guide," but my observations are that from the time of their appearance in early summer until late in the season (just what date I have no record to state from), when they disappear for the winter; they are more or less constant with us and may be seen in varying numbers at any time.

They are distinctively what might be termed a domestic insect and the caterpillar or larva must be familiar to every observer in country home. These range from one and one quarter to two inches or more in length, most commonly found on the caraway and like plants on the leaves of which they feed. They are yellow striped and spotted with black and when irritated push out from a slit in the prothaic ring, a V-shaped fleshy yellow scent organ which they employ as a means of defense, and which is quite equal in proportion to its size to the firearm of the skunk.

Unfortunately I have been unable to record the time which elapses between the hatching of the larva and the passing of the same from the larva to the pupa stage, nor have I seen any record of same by any authority. In the pupa stage however the time passed is from nine to fifteen days and from this the perfect insect emerging with folded wings, in the course of an hour or two of painful crawling and slow closing and expanding of the wings, has fully developed the latter organ.

The male averages a trifle smaller than the female, having the blue mottling on the wings either almost invisible or entirely wanting and a band of large conspicuous spots of bright yellow traversing both pairs of wings about midway from body to outer margin.

When the larva first passes into the pupa or chrysalis the latter is a decidedly yellowish-green and from this passes to a brownish-yellow and then a yellowish-brown, the latter color deepening as the time of emerging of the butterfly approaches. It is during this chrysalis stage that the attacks of the parasite *Trogus epssorius.* Brulle. It is an insect of a tawny-red or red-brown color.

My caterpillars were collected from their breeding grounds on the caraway and confined in a small wood box, over the top of which mosquito bar was fastened. They were kept supplied with fresh leaves and the box kept in a cool, moist place, until the inmates established themselves on the sides in this second stage of development. The box was then removed to a position just outside my chamber window, on a tin roof, north side of the house and out of the sun.

Also the precaution of keeping the mosquito bar over a hole some half inch in diameter in one side of the box was no longer considered necessary. Alas! And yet perhaps no reason, for where I lost two specimens I gained two more and a new observation which was just as fresh and delightful as though I had made a discovery new to the scientific world.

My first specimen duly came forth and developed and was put to death and illustrated and finally added to my collection, but my other two specimens were more tardy and thereby forfeited such a distinguished fate. Now who would have thought that the nature of *T. epssorius* should be so ruthless and relentless as to pursue his victim even into the poor creature's prison and there forever bar the possibility those *asterias* from posing before the world as aught but empty chrysalis shells? But such was the case. One morn an inspection of my box proved that two new lives had forced themselves into it through that small hole and the premature gaping hole in the side of the chrysalis told the tale of how the other lives had escaped without the aid of their "wings of flame."

The papilio (*P. asterias*) is not as a general thing a "high-flyer" being found most commonly in the vicinity of the plants on which the larva feed but roaming the fields to some extent and found occasionally in almost all kinds of situations.

A case of hermaphroditism in this species is recorded in the Proceedings of the Philadelphia Entomological Society (Vol. IV, p. 380) as follows:

"A specimen of *Papilio asterias* is in my collection, and was captured by Mr. J. Megers of Brooklyn, L. I., two or three years since. It is a fine instance of a perfect hermaphrodite. The right wings are both male, the left wings both female, distinctly marked upon both surfaces with no suffusion of color. The size is that of the largest specimen of *Asterias.*"

Mr. Saunders submitted to Mr. Packard a specimen from St. Johns, Newfoundland, which he considered a new species and named *Papilio brevicanda,* saunders. Mr. Packard, however, is inclined to regard it as a remarkable variety of *Asterias.* Mr. Saunders thus describes the points of difference:

"In *P. asterias* the palpi are edged within with yellow; in *P. brevicauda* they are black; *P. asterias* has two yellow spots above at the base of the antennæ, which are

* NOTE I have had free access to "Packard's Manual,"—that valuable manual of the entomologist—to supplement my knowledge, memory and notes in the preparation of this article and to that authority I wish to give due credit. My thanks are also due to Mr. Beutenmuller, entomologist of the American Museum. for kindnesses shown me while preparing these notes. B. S. B.

Title-page of Vol. I and Index (pp. 51-52)
removed from here to
proper place of insertion.
J. D. J.

either wanting or exceedingly faint in *P. brevicauda*. *P. asterias* has a spot of bright yellow on the anterior edge of the throax. *P. brevicauda* has a fringe of duller yellow extending fully half the length of the thorax. On the primaries the discal bar in *P. asterias* is much narrower, and the row of spots smaller and brighter yellow, the upper one in the row being divided; in *P. brevicauda* the spots are fulvous, the upper one is undivided. The inner row of spots are also entirely yellow in *P. asterias*, smaller and very different in form from those on *P. brevicauda*. The second row of spots is also smaller in *P. asterias* and the red spot at the anal angle paler with a small black spot in it, and a wider crescent of bluish atons above. The length of the tail, which is one of the most striking points of difference, has already been noticed."

Packard himself says: "We have compared some interesting specimens of *P. asterias* in the Boston Museum of Natural History, collected about Boston by Mr. Shurtleff, which approach (in the reddish hue of the spots, usually yellow, especially on the under side, and in the shortness of the tail) the Newfoundland specimen kindly sent us by Mr. Saunders, and strongly suggest the inference, with which Messrs. Scudder and Sanborn agree, that *P. brevicauda* is a very remarkable local variety of *P. asterias*."

Hoping that we shall hear more of the life histories of our common insects has been the spirit of this endeavor.

B. S. BOWDISH,
New York City.

A Katydid Samson.

A correspondent of the *Popular Science News* tells how he harnessed a katydid to a kind of sled made by folding a piece of ordinary note paper, and then loaded the sled with various articles. The insect proved able to draw in addition to the original paper, twelve paper sheets each three by four and one-half inches, a large screw, two steel pens, a stone weighing two ounces and three and a half lead pencils. When the weight became too heavy to be drawn otherwise the katydid got its forefeet over the edge of the table for a better hold and on the addition of another weight it increased the adhering power of its feet by moistening them in its mouth.

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Family CATHARTIDÆ.—American Vultures.

325. TURKEY VULTURE. *Cathartes aura.* Straggler. One shot in town of Clarendon, Orleans Co., on July 18, 1891.

326. BLACK VULTURE. *Catharista atrata.* A rare straggler. One taken near Medina, Orleans Co., May 28, 1892.

Family FALCONIDÆ.—Hawks, Eagles, Falcons, etc.

331. MARSH HAWK. *Circus hudsonius.* Summer resident and breeds.

332. SHARP-SHINNED HAWK. *Accipiter velox.* Summer resident and breeds. Not *very* common.

333. COOPER'S HAWK. *Accipiter cooperii.* Summer resident and breeds. One of our common raptores.

334. AMERICAN GOSHAWK. *Accipiter atricapillus.* Rare winter visitor.

337. RED-TAILED HAWK. *Buteo borealis.* Common summer resident and breeds.

339. RED-SHOULDERED HAWK. *Buteo lineatus.* The most common of all our larger Hawks. Breeding in all suitable places.

342. SWAINSON'S HAWK. *Buteo swainsonii.* A very rare straggler. Nathan L. Davis, formerly of Brockport, writes me that he caught a young bird of this species on Oct. 1, 1889, in a trap; which he kept for some time. He is positive as to the identity.

343. BROAD-WINGED HAWK. *Buteo latissimus.* Summer resident and breeds. Not nearly as common as *borealis* and *lineatus.*

347a. AMERICAN ROUGH-LEGGED HAWK. *Archibuteo lagopus sancti-johnannis.* Common winter and spring visitor. Most common in Monroe Co. in March and April.

352. BALD EAGLE. *Haliactus leucocephalus.* Occasional visitor and probably a rare breeder along Lake Ontario.

356. DUCK HAWK. *Falco peregrinus anatum.* Rare in fall and winter.

357. PIGEON HAWK. *Falco columbarius.* Common migrant. Reported by L. V. Case as having nested near Naples, Ontario Co. Certainly a rare breeder.

360. AMERICAN SPARROW HAWK. *Falco sparverius.* Common summer resident and breeds.

364. AMERICAN OSPREY. *Pandion haliactus carolinensis.* Common migrant. Especially on the lake.

Family BUBONIDÆ.—Horned Owls, etc.

366. AMERICAN LONG-EARED OWL. *Asio wilsonianus.* Occasional migrant and may possibly breed.

367. SHORT-EARED OWL. *Asio accipitrinus.* Common fall and winter visitant and possible rare breeder.

368. BARRED OWL. *Syrnium nebulosum.* Rare visitor. Reported from Orleans and Niagara Co's.

372. SAW-WHET OWL. *Nyctala acadica.* Common fall visitor and rare resident. Breeds.

373. SCREECH OWL. *Megascops asio.* Common resident and breeds.

375. GREAT HORNED OWL. *Bubo virginianus.* Common resident and breeds.

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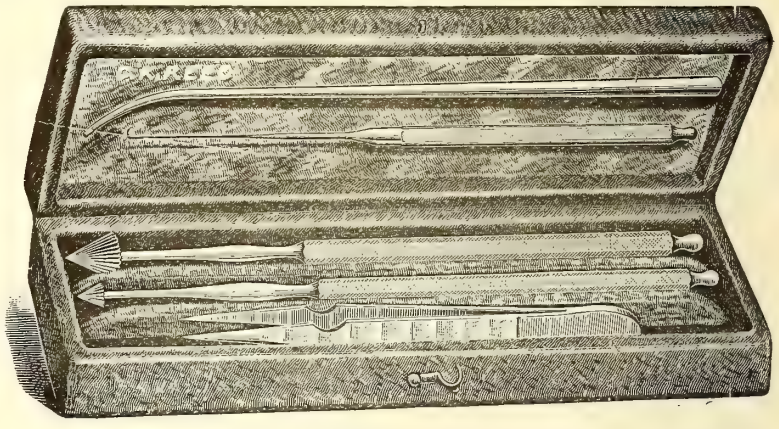

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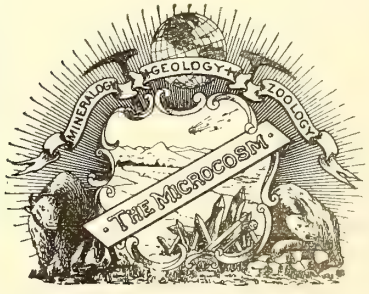

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A Weekly Journal Devoted to Natural History.

FRANK H. LATTIN, Editor and Publisher,
ALBION, N. Y.

Correspondence and items of interest to the student of any of the various branches of the Natural Sciences solicited from all.

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The Early Discovery of Coal.

Bituminous coal, or sea coal, was known upwards of a thousand years ago, in the year 853, but did not come into general use until the 16th century, and was not used in the manufacture of iron until the 17th century. Anthracite coal came gradually into use so late as the 19th century, and was not used as fuel fn the manufacture of iron until about 36 years ago.

So early as 1790 anthracite coal was known to abound in the county of Schuylkill, in the State of Pennsylvania; but it being of a different quality from that known as sea coal or bituminous coal, and being hard of ignition, it was deemed useless until the year 1795 when a Pennsylvania blacksmith, named Whetstone, brought it into notice. His success in burning it induced persons to dig for it: but when found, every person connected with the enterprise had to experiment on its combustion, and vain were the attempts to burn it by the majority of them, and all came to the conclusion that it would not come into general use.

About the year 1800, Mr. Morris, who had a large tract of land in Schuylkill county, Pennsylvania, procured a quantity of coal therefrom, and took it to Philadelphia city, but he was unable with all his heroic exertions to bring it into notice, and abandoned all his plans. From that time until 1806 it was talked about as a humbug; when accidently a bed of coal was found in digging a tail race for a water wheel for a forge, which induced another blacksmith, David Berlin, to make a trial of it. His success was generally made known, which induced others to try to burn Pensylvania coal.—*Scientific American.*

BIRDS OF WESTERN NEW YORK.

ERNEST H. SHORT.

376. SNOWY OWL. *Nyctea nyctea.* Occasional winter visitor.

377a. AMERICAN HAWK OWL. *Surnia ulula caparoch.* Occasional winter visitant. L. V. Case reports two from Naples, Ontario Co. Also mentioned by G. F. Guelf of Brockport.

Order COCCYGES. Cuckoos, etc.

Family CUCULIDÆ.—Cuckoos.

387. YELLOW-BILLED CUCKOO. *Coccyzus americanus.* Summer resident and breeds.

388. BLACK-BILLED CUCKOO. *Coccyzus erythrophthalmus.* Common summer resident and breeds.

Family ALCEDINIDÆ.—Kingfishers.

390. BELTED KINGFISHER. *Ceryle alcyon.* Common summer resident and breeds.

Order PICI. Woodpeckers.

Family PICIDÆ.—Woodpeckers.

393. HAIRY WOODPECKER.. *Dryobates villsosus.* Resident and breeds. Not as common as next.

394. DOWNY WOODPECKER. *Dryobates pubescens.* Common resident and breeds.

402. YELLOW-BELLIED SAPSUCKER. *Sphyrapicus varius.* Regular migrant though not common. A rare breeder. A nest containing four young found in Medina by Harry A. Chase.

405. PILEATED WOODPECKER. *Ceophlœus pileatus.* Rare resident and breeder. Seems to be confined to the wildest parts of the southern tier of counties.

406. RED-HEADED WOODPECKER. *Melanerpes erythrocephalus.* Common summer resident and breeder.

409. RED-BELLIED WOODPECKER. *Melanerpes carolinus.* Regular visitor in small numbers. Most common in December.

412. FLICKER. *Colaptes auratus.* Common summer resident and breeds. Occasional winter resident.

Order MACROCHIRES. Goatsuckers, Swifts and Hummers.

Family CAPRIMULGIDÆ.—Goatsuckers.

417. WHIP-POOR-WILL. *Antrostomus vociferus.* Rare summer resident and breeds.

420. NIGHTHAWK. *Chordeiles virginianus.* Summer resident and breeder.

Family MICROPODIDÆ.—Swifts.

423. CHIMNEY SWIFT. *Chætura pelagica.* Common summer resident and breeder.

Family TROCHILIDÆ.—Hummingbirds.

428. RUBY-THROATED HUMMINGBIRD, *Trochilus colubris.* Common summer resident and breeder.

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Order PASSERES. Perching Birds.

Family TYRANNIDÆ.—Tyrant Flycatchers.

444. KINGBIRD. *Tyrannus tyrannus.* Common summer resident and breeder.

452. CRESTED FLYCATCHER. *Myiarchus crinitus.* Summer resident and breeder. Not as common as last.

456. PHŒBE. *Sayornis phœbe.* Abundant summer resident and breeder.

459. OLIVE-SIDED FLYCATCHER. *Contopus borealis.* Reported by J. L. Davison as a rare migrant.

461. WOOD PEWEE. *Contopus virens.* Common summer resident and breeder.

463. YELLOW-BELLIED FLYCATCHER. *Empidonax flaviventris.* Rare summer resident and breeder. Not very common.

465. GREEN-CRESTED FLYCATCHER. *Empidonax virescens.* Occasional summer resident and breeder. Apparently confined to the higher woods.

466a. ALDER FLYCATCHER. *Empidonax traillii alnorum.* Said to be not uncommon in some places. A rare summer resident and breeder in Monroe county.

467. LEAST FLYCATCHER. *Empidonax minimus.* A rare summer resident near Chili. Reported by Neil F. Posson as common at Medina. L. V. Case also mentions its nesting at Naples.

Family ALAUDIDÆ.—Larks.

474. HORNED LARK. *Otocoris alpestris.* Occasional winter visitor.

474b. PRAIRIE HORNED LARK. *Otocoris alpestris praticola.* Common summer resident and breeder. Seems to be with us nearly all the time from Jan. 1st to December 1st. Breeds twice, in March and April and in June.

Family CORVIDÆ.—Crows, Jays, etc.

477 BLUE JAY. *Cyanocitta cristata.* Resident and breeds. Seems to be local in distribution.

488. AMERICAN CROW. *Corvus americanus.* Common resident and breeder. Abundant in Chili, Monroe County, especially in winter, there being a large roost near there.

Family ICTERIDÆ.—American Starlings.

494. BOBOLINK. *Dolichonyx oryzivorus.* Abundant summer resident. Breeds.

495. COWBIRD. *Molothrus ater.* Abundant summer resident. Deposits its eggs in the nests of the followiug birds, viz: Kingbird, Meadowlark, Purple Finch, Vesper Sparrow, Chipping Sparrow, Field Sparrow, Song Sparrow, Indigo Bunting, Red-eyed Vireo, Yellow-throated Vireo, Warbling Vireo, Yellow Warbler, Chestnut-sided Warbler, Ovenbird, American Redstart, Towhee, Golden-winged Warbler, Cedar Waxwing, Wood Thrush, Wilsons Thrush, Robin, Bluebird, Hermit Thrush, Water Thrush, and possibly others.

498. RED-WINGED BLACKBIRD. *Agelaius phœniceus.* Abundant summer resident. Breeds.

501. MEADOWLARK. *Sturnella magna.* A common summer resident, a few staying all winter. Breeds.

More About "Joint Snakes."

In the first number of NATURAL SCIENCE NEWS was an interesting article about "joint snakes." The writer of that article handles the subject in a pleasing way, and he no doubt is correct in classing this reptile as a lizard.

Not knowing anything scientifically about this very queer reptile, I can probably add nothing new to what is already known concerning it.

But as the "glass" or "joint snake" is so rarely found in this latitude, it might be of interest to the readers of this paper for me to mention the one instance in which I met with his snakeship.

In the afternoon of the 12th of June, 1886, near the village of Denmark, Lee county, Iowa, I, in company with a friend went for a few hours hunt.

In a heavily timbered creek bottom and near the water edge, we came suddenly upon a small snake. It tried at first to escape us. But after a few "round ups" with a small stick, the animal concluded to remain and get acquainted.

The length of the reptile was about sixteen inches, and its color struck us at once as being odd.

It was of a clear greenish olive color, darkened on the back throughout its length by brownish-black lines. The darkening was not very pronounced, so that the general appearance was an olive-green.

Its actions were precisely like those of the common garter snake, except at one time when the stick that was tormenting it became too rough, it disjointed or divided itself into at least four parts, all the parts being of about equal length.

We were much surprised to see this happen, as we did not know until then that we had found a specimen of the almost mythical "joint snake."

The different parts of this strange reptile wriggled, writhed, and twisted about in the rank blue grass, until all the parts except the part including the head had disappeared.

I remember crushing the head with my stick, making the remark as I did so that, "I would be sure of that much anyhow."

We then examined the end where it came unjointed, and instead of having the appearance of "mus-

506. Orchard Oriole. *Icterus spurius.* A rare straggler. Saw one June 26, 1893, a male. Possibly was breeding. A male, one of a pair, was shot at Chili by W. C. Voke about May 18, 1896. Female was seen at the time.

507. Baltimore Oriole. *Icterus galbula.* Abundant summer resident. Breeds.

509. Rusty Blackbird. *Scolecophagus carolinus.* Common migrant, especially in the fall.

511b. Bronzed Grackle. *Quiscalus quiscula æneus.* Abundant summer resident. Breeds.

Family FRINGILLIDÆ.—Finches, Sparrows, etc.

514. Evening Grosbeak. *Coccothraustes vespertina.* During the winter of 1889 and 1890 the remarkable movement of this species to the east extended over Western New York. Specimens were taken at Brockport, Albion, Gaines, Chili, Lockport and Naples.

515. Pine Grosbeak. *Pinicola enucleator.* Occasional migrant in severe winters. While large numbers passed through New England in 1892-93 few if any seemed to have passed as far west as this. Common during the winter of 1895-6.

517. Purple Finch. *Carpodacus purpureus.* Common summer resident. Breeds.

521. American Crossbill. *Loxia curvirostra minor.* A winter visitant. Not common.

522. White-winged Crossbill. *Loxia leucoptera.* A rare straggler. Reported from Brockport by G. F. Guelf.

528. Redpoll. *Acanthis linaria.* Irregular winter visitor. Sometimes common.

529. American Goldfinch. *Spinus tristis.* Abundant summer resident. Breeds. Often seen in the winter and like the Meadowlark may be classed as an occasional resident in winter.

533. Pine Siskin. *Spinus pinus.* Irregular fall and winter visitor, and very rare breeder. One nest taken in spring of 1889.

534. Snowflake. *Plectrophenax nivalis.* Abundant winter visitant.

536. Lapland Longspur. *Calcarius lapponicus.* Occasional winter visitant.

540. Vesper Sparrow. *Poocætes graminicus.* Abundant summer resident and breeds.

542a. Savanna Sparrow. *Ammodramus sandwichensis savanna.* Common summer resident in suitable localities. Breeds.

546. Grasshopper Sparrow. *Ammodramus savannarum passerinus.* Reported by J. H. Langille as a summer resident near West Barre, Orleans Co. A nest containing four eggs found near Maplewood, Monroe Co., June 1, 1893. Eggs were fresh and I positively identified the species. Since writing the above nests have been taken as follows: two at Phelps, Ontario Co., and one at Chili, each containing four eggs. It may safely be called an occasional summer resident.

554. White-crowned Sparrow. *Zonotrichia albicollis.* A common migrant.

558. White-throated Sparrow. *Zonotrictria albicollis.* Abundant migrant.

559. Tree Sparrow. *Spizella monticola.* Common migrant and occasional winter resident.

560. Chipping Sparrow. *Spizella sociulis.* Abundant summe rresident. Breeds.

563. Field Sparrow. *Spizella pusilla.* Summer resident and breeds. Not very common.

cles, nerves, and blood vessels broken or shattered," the muscles, ect. appeared to be drawn to a blunt apex, not unlike in shape to the smoothly sharpened end of a pencil.

The whole end where the dividing took place was closely covered by a thin, transparent membrane.

We reasoned that the convex surface of this end must have fit into a concave shaped end on the part that had once been attached to it.

Of the parts that writhed about and disappeared, I remember nothing definitely about, except that the ends of them had the same general appearence as the end we examined.

I do not remember the shape of the head and neck of this reptile, but the party who was with me says that the animal had scarcely any neck, the head merging directly into the body.

C. E. Purcell,
Burlington, Iowa.

Rock Crystal.

This is one of the most widely distributed of minerals and found in all parts of the world. A group of crystals in the University of Naples weighes nearly one-half a ton. A crystal at Milan is three and one-half feet in length and five and one-half feet in circumference and weighs nearly 875 pounds. Herkimer Co., N. Y. produces clear, doubly terminated crystals. All along the Upper Mississippi are found round masses of quartz which, when broken open show cavities lined with crystals. Groups of crystals are highly valued in China and Japan as ornaments for the apartments of the rich.

It is employed for spectacle glasses, being far superior to glass and is not so liable to lose its high polish. It is also used in optical instruments. When used for such purposes it is called Brazilian Pebble. In India the natives hollow it out in cups, globes and vases. They believe it to be the mother or external husk of the diamond, and call the crystal the unripe, and the diamond the ripe diamond. The Chinese do not cut it as well as the natives of India. The Japanese cut it into round balls used for cooling the hands, for, like all true stones it feels much cooler than paste or glass. The Greeks supposed it to be water congealed by intense cold and believed it could only be found in the far

567. Slate-colored Junco. *Junco hyemalis.* Common migrant. Reported by L. V. Case as an occasional breeder at Naples, Ontario Co. Also breeds sparingly in Erie, Cattaraugus, and possibly other counties.

581. Song Sparrow. *Melospiza fasciata.* Common summer resident and breeds.

583. Lincoln's Sparrow. *Melospiza lincolni.* Occasional migrant.

584. Swamp Sparrow. *Melospiza georgiana.* Summer resident and breeds. Probably much more than the records show, owing to its secluded habits.

585. Fox Sparrow. *Passerella iliaca.* Occasional spring migrant.

587. Towhee. *Pipilo erythrophthalmus.* Rare summer resident and breeds.

593. Cardinal. *Cardinalis cardinalis.* Very rare straggler. Mr. J. L. Davison reports securing a male on May 10, 1883. Also saw specimens in January on two occasions. My father secured a specimen in winter or early spring some years ago.

595. Rose-breasted Grosbeak. *Hubia ludovinciana.* Common summer resident and breeder.

589. Indigo Bunting. *Passerina cyanea.* Common summer resident and breeder.

Family TANAGRIDÆ.—Tanagers.

608. Scarlet Tanager. *Piranga erythromelas.* Summer resident and breeds.

Family HIRUNDINIDÆ.—Swallows.

611. Purple Martin. *Progne subis.* Rare summer resident in in some localities. Breeds. Reported by N. F. Posson as fairly common in Medina.

612. Cliff Swallow. *Petrochelidon lunifrons.* Common summer resident. Breeds.

613. Barn Swallow. *Chelidon erythrogaster.* Abundant summer resident. Breeds.

614. Tree Swallow. *Tachycineta bicolor.* Summer resident and breeds. Not as common as most of our swallows.

616. Bank Swallow. *Clivicola riparia.* Abundant summer resident in localities. Breeds mostly in colonies.

617. Rough-winged Swallow. *Stelgidopteryx serripennis.* Summer resident and breeds. Seems to be confined to localities where stone work abounds, in the crevices of which it breeds.

Family AMPELIDÆ.—Waxwings.

618. Bohemian Waxwing. *Ampelis garrulus.* An irregular winter visitant.

619. Cedar Waxwing. *Ampelis cedrorum.* Common summer resident and breeds. Occasionally seen in winter.

Family LANIDÆ.—Shrikes.

621. Northern Shrike. *Lanius borealis.* Occasional winter visitant.

621a. Loggerhead Shrike. *Lanius ludovicianus.* Rare summer resident. Breeds. Reported by F. H. Lattin of Gaines, Orleans Co.

622a. White-rumped Shrike. *Lanius ludovicianus excubitorides.* Common summer resident. Breeds.

north. In the middle ages it was believed to be incapable of containing poisons, and would betray their presence by breaking or becoming obscured, consequently cups and goblets made of it were highly esteemed. The Emperor Nero is said to have possessed two magnificent crystal cups engraved with subjects of the Illiad, which cost an enormous sum. When his downfall took place he destroyed them that no one else might drink from them. The large round balls under proper manipulation were supposed to disclose events which were to happen and showed persons who were distant. Pieces were held against the tongue in fevers to assuage thirst. For this purpose it is still used. In 1791 the quartz crystal treasures of the crown of France were valued at $500,000 of our money.

H. C. Simons,
Philadelphia, Pa.

A Mountain of Solid Granite.

In Burnet County, Texas, rising abruptly out of the level prairie, is a mountain of solid granite, as smooth and bald as a negro's head, without hair. It covers an area of seventy-five acres and rises two hundred feet above the surrounding surface. It contains, above the level of the base, one hundred million cubic feet of granite, available to the quarryman without a foot of dirt or other matter to be stripped off. The value of granite at the quarry in Eastern States is twenty-five cents per cubic foot. The granite in this mountain, at the nominal value of one cent per cubic foot, would be a million dollars for the amount of stone above the level or its base. The size of the stones which may be here quarried and moved is limited only by the capacity of machinery for moving them. Tests made by Col. D. W. Flager; of the United States Army, at the Arsenal, Rock Island, Ill., and certified by him to the Texas capital commissioners, show the crushing strength of the granite from this mountain to be 11,891 pounds to the square inch, while the ratio of absorption of water to the weight of stone tested was only 0·00094 after soaking forty-three hours. Its specific gravity is 2·8249. The granite from this mountain is pronounced equal to the celebrated Scotch granite and it contains comparatively no iron or other foreign matter. It is stripped by nature,

Family VIREONIDÆ.—Vireos.

624. Red-eyed Vireo. *Vireo olivaceus.* Common summer resident. Breeds.

626. Philadelphia Vireo. *Vireo philadelphicus.* Occasional migrant and may possibly breed.

627. Warbling Vireo. *Vireo gilvus.* Common summer resident. Breeds.

628. Yellow-throated Vireo. *Vireo flavifrons.* Summer resident and breeds. Not very common.

629. Blue-headed Vireo. *Vireo solitarius.* A rare migrant.

Family MNIOTILLIDÆ.—Wood-warblers.

636. Black and White Warbler. *Mniotilta varia.* Migrant, usually seen in the spring.

639. Worm-eating Warbler. *Helmitherus vermivorus.* Occasional migrant and possibly breeds.

641. Blue-winged Warbler. *Helminthophila pinus.* Mr. Davison reports securing a female July 21, 1889. An occasional migrant.

642. Golden-winged Warbler. *Helminthophila chrysoptera.* Summer resident and breeds. Have found it nesting at Chili and it is reported as breeding at Medina and Naples.

645. Nashville Warbler. *Helminthophila ruficapilla.* Common migrant and rare summer resident. Breeds.

647. Tennessee Warbler. *Helminthophila peregrina.* Occasional migrant and rare summer resident. Breeds.

648. Parula Warbler. *Compsothlypis americanus.* Rare summer resident and breeds.

650. Cape May Warbler. *Dendroica tigrina.* Rare migrant.

652. Yellow Warbler. *Dendroic æstiva.* Abundant summer resident and breeds.

654. Black-throated Blue Warbler. *Dendroica cærulescens.* Common migrant.

655. Myrtle Warbler. *Dendroica coronata.* Common migrant.

657. Magnolia Warbler. *Dendroica maculosa.* Common migrant and rare resident. Breeds.

658. Cerulean Warbler. *Dendroic cærulea.* Summer resident and breeds. Not very common.

656. Chestnut-sided Warbler. *Dendroica pennsylvanica.* Summer resident and breeds. Not very common.

660. Bay-breasted Warbler. *Dendroica castanea.* Migrant in flocks. This and the next species sometimes swarm in places where feed is plenty.

661. Black-polled Warbler. *Dendroica striata.* Common migrant with the last.

662. Blackburnian Warbler. *Dendroica blackburniæ.* Common migrant. Said by Langille to be resident in Tonawanda Swamp, Orleans Co., through the summer.

667. Black-throated Green Warbler. *Dendroica virens.* Common migrant. Mr. Davison reports finding a young one unable to fly on June 24, 1883. Probably a very rare breeder.

671. Pine Warbler. *Dendroica vigorsii.* Mr. Davison reports it a very rare migrant. I have never seen one taken in this vicinity.

672. Palm Warbler. *Dendroica palmarum.* Rare migrant.

674. Ovenbird. *Seiurus aurocapillus.* Summer resident and breeds.

675. Water-Thrush. *Seiurus noveboracencis.* Summer resident. Breeds. Not common.

677. Kentucky Warbler. *Geothlypis formosa.* Shot one in May, 1894. Mr. Davison reports seeing a male on May 21, 1891.

678. Connecticut Warbler. *Geothlypis agilis.* Rare migrant. Saw one in August, 1893, just after the first edition of this list had gone to press.

679. Mourning Warbler. *Geothlypis philadelphia.* Migrant. Reported by Neil F. Posson as a summer resident.

681. Maryland Yellow-throat. *Geothlypis trichas.* Summer resident and breeds.

and lies in a regular strata, is very easily quarried and cut, and assumes a magnificent polish. In color it varies from the red or rose colored stone of which the State capitol is constructed, to a light gray, with various intermediate shades. Granite has been taken from this mountain for the capitol building and dam at Austin, the jetty works at Galveston Harbor and mouth of Brazos River, and the government building at Kansas City, without having any perceptible effect upon its appearance. At a distance it looks as if it had never been touched.—*Walfred Wilson in Scientific American.*

Biggest of Big Trees.

The largest tree in the State of California, or on the American continent, perhaps, is "Old Sequoia," the titan of all the redwood giants, which stands at an altitude of 5,300 feet above sea level, at a distance of seventeen miles from the Yosemite Valley. At present the "Old Sequoia" is but a blackened stump, but as it stands it is without doubt the oldest representative of the vegetable kingdom in the world. At one time, before fire and wind partially destroyed the grove of "big trees" of which it was the chief, "Old Sequoia" was more than 100 yards high and upward of fifty feet in diameter. At present the "stump" is 185 feet high and about forty-one feet in diameter near its charred and blackened roots. Quite a "stump" after all.—*St. Louis Republic*

Live Bookworms.

Mr. Austin, an assistant librarian in the Cornell library, while cataloguing the fine Dante collection presented to the University by Prof. Willard Fiske, has found some live bookworms in an edition of the "Divine Comedy," bearing the date 1136. This is the third time only that these insects have been found in an American library. Prof. Comstock, of the entomological department has succeeded in raising from the insects a number of eggs, worms and beetles for the University museum.—*New York Mercury.*

The largest sponge ever sent to market was from the Mediterranean. It was ten feet in circumference and three in diameter.

Amount of Volcanic Dust.

In a paper presented in Philadelphia a month or two ago, Prof. N. S. Shaler called attention to the importance of volcanic dust as a geologic agent. Basing some conclusions of the great volcanic activity in recent years in the Island of Java and the district near by, Professor Shaler thinks that the vocanic dust which settles on the ocean is perhaps quite equal in amount to all the soil that is carried down by the rivers. It may even be equal he thinks to the whole amount of rock material which falls into the sea from all causes, put together, includlng the true dust of the land which is blown in by the wind. If either one of these suppositions be true, and it is not likely that Professor Shaler has made up his mind without good reasons for doing so, it is evident that the relation of volcanic dust to the formation of land has by no means been appreciated. The supposition finds supporting evidence in the fact that pumice-stone deposits are noticeable along the coasts of our own country.—*Happy Thought.*

In the Chemical Laboratory.

Professor—"What has become of Tom Appleton? Wasn't he studying with the class last year?"

"Ah, yes; Appleton—poor fellow: A fine student, but absent minded in the use of chemicals—very. That discoloration on the ceiling—notice it?"

"Yes."

"That's Appleton."—*Pearson's Weekly.*

A Venezuelan Exhibit.

One of the latest additions to the Philadelphia Museum is the Venezuelan exhibit from the Atlanta Exposition, which comes as a gift from the Venezuelan Government, and which illustrates by a collection of 3,000 objects the researches of her forests, mines, and fields. Such an exhibit will prove very valuable to our manufacturers and merchants; and it would well repay the statesmen at Washington for the time and trouble expended in looking over the collection.—*Philadelphia Record.*

683. Yellow-breasted Chat. *Icteria virens.* Rare summer resident. On May 26, 1890, I found a nest at Chili, (see *Oologist,* Sept., 1892) containing one egg. Think they are very rare in this latitude.

684. Hooded Warbler. *Sylvania mitrata.* Summer resident. Breeds.

685. Wilson's Warbler. *Sylvania pusilla.* Reported by Mr. Davison as a rare migrant. Must be very rare.

686. Canadian Warbler. *Sylvania canadensis.* Migrant and possible summer resident.

687. American Redstart. *Setophaga ruticilla.* Abundant summer resident in suitable localities. Breeds.

Family MOTACILLIDÆ.—Pipits, etc.

697. American Pipit. *Anthus pensylvanicus.* Irregular fall visitor.

Family TROGLODYTIDÆ.—Thrashers and Wrens.

703. Mockingbird. *Mimus polyglottus.* Rare visitor and possible breeder. Reported by L. V. Case of Naples.

704. Catbird. *Galeoscoptes carolinensis.* Abundant summer resident and breeds.

705. Brown Thrasher. *Harporhynchus rufus.* Rare summer resident, becoming more common in the southern counties. Breeds.

718. Carolina Wren. *Thryothorus ludovicianus.* One taken four miles north of Batavia, Genesee Co., about Dec. 22, 1894, by Alfred Garrett of Gaines, Orleans Co. Very rare straggler.

721. House Wren. *Troglodytes ædon.* Summer resident. Breeds.

722. Winter Wren. *Troglodytes hiemalis.* Migrant. Not very common.

724. Short-billed Marsh Wren. *Cistothorus stellaris.* Summer resident and breeds. Local on the lake.

725. Long-billed Marsh Wren. *Cistothorus palustris.* Common summer resident on the lake shore. Breeds.

Family CERTHIDÆ.—Creepers.

726. Brown Creeper. *Certhia familiaris americana.* Common migrant and often seen in winter.

Family PARIDÆ.—Nuthatches and Tits.

727. White-breasted Nuthatch. *Sitta carolinensis.* Resident. Everywhere common. Breeds.

728. Red-breasted Nuthatch. *Sitta canadensis.* Occasional winter visitant.

735. Chickadee. *Parus atricapillus.* Common resident and breeds.

Family SYLVIIDÆ.—Kinglets and Gnatcatchers.

748. Golden-crowned Kinglet. *Regulus satrapa.* Common migrant. Said to winter here.

749. Ruby-crowned Kinglet. *Regulus calendula.* Common migrant.

751. Blue-gray Gnatcatcher. *Polioptila cærulea.* Very rare summer resident. Know of only one instance of its breeding. A pair reared their young near Coldwater, Monroe Co., during the summer of 1890.

Family TURDIDÆ.—Thrushes, Bluebirds, etc.

755. Wood Thrush. *Turdus mustelinus.* Common summer resident. Breeds.

756. Wilson's Thrush. *Turdus fuscescens.* Common summer resident. Breeds.

757. Gray-cheeked Thrush. *Turdus aliciæ.* Mr. Davison in his list in *Forest and Stream,* Sept., 1889, reported it as an uncommon migrant. I have never taken the species.

758a. Olive-backed Thrush. *Turdus ustulatus swainsonii.* Occasional migrant and very rare breeder. Reported by F. H. Lattin as nesting at Gaines, Orleans Co., during the summers of 1880-81.

759b. Hermit Thrush. *Turdus aonalaschkæ pallasii.* Common migrant and rare breeder. Have found nests at Chili during 1889-90-92-93. Also reported by L. V. Case as a rare migrant at Naples, Ontario Co.

761. American Robin. *Merula migratoria.* Abundant summer resident. Breeds.

766. Bluebird. *Sialia sialis.* Abundant summer resident. Breeds.

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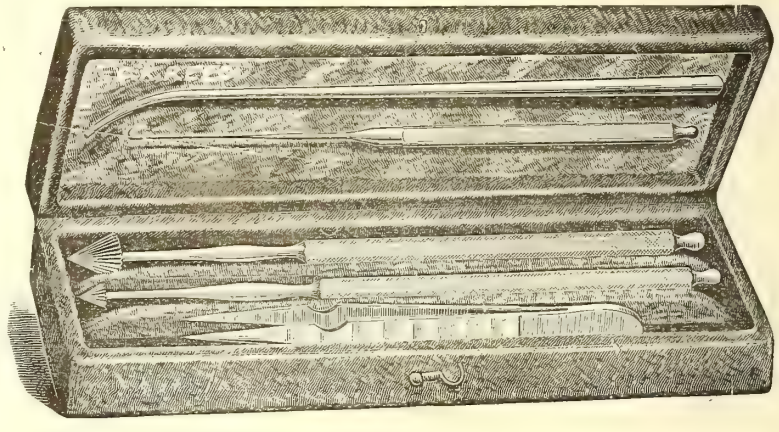

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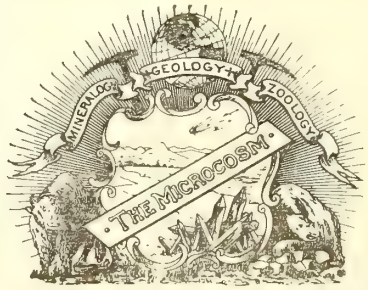

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